

acres and they are only irrigating three thousand the duty applies to the four thousand acres all the time.

MR. RAY: That was just my question. I didn't put it intelligently then or you would have understood it.

Q Now, as I understand Mr. Wentz, the tables that you refer to in parts 22 of your report, or part 8 of your report have no application in any way to this table that you have placed upon the blackboard?

A No, those tables have no --

Q You merely stated in these tables that that was the quantity of water that you had distributed to the various users?

A Yes, based on those areas.

Q Based on those areas, and in your opinion it was sufficient water?

A Yes.

Q But it has no connection or application to the tables placed upon the board? A: No.

Q The table that you have placed upon the blackboard, if you know, you may state whether or not it gives a greater duty than the tables referred to in part 8, or whether it gives a less duty -- I think, however, the duties are given in all these tables and show for themselves -- let me ask you one more question first, Mr. Wentz, I take it that in the preparation of this table which is placed upon the blackboard, you have -- in making this table you have used what experience you have had in irrigation and in the distribution of the water of the G. rovo River, and your knowledge of the soil and such like that you have heretofore stated?

A Yes, and my conclusions reached by the distribution of last year, at the conclusion of last year.

Q Now, you may answer the other question if you can?

A The distribution last year was made on the gross duty, and we have not the measurements of the inflow. Generally speaking

for
the distribution of last year, say July, from July 1st to the 6th was on a 60 acre duty on the main system. In this table I have used a 63 acre duty net at the place of delivery, which, in my opinion on some of the systems, on the main system, would be a greater amount of water than the amount supplied last year. The systems with a heavy inflow it would be a less amount.

Q In other words, this table on the blackboard gives a greater quantity of water at the land than was actually distributed during 1915 at the head of the canal during the month of July?

MR. RAY: I submit the witness has just answered that by saying "in some cases more and where there was an inflow less".

MR. JACOB EVANS: I was trying to find out what the facts were. Will you read my question.

THE COURT: I didn't understand the substance of the answer to be as you put it.

MR. JACOB EVANS: That was just the point I wanted to arrive at.

THE COURT: I didn't understand it just that way. Read the question, Mr. Davis.

(Question read)

A No, the table on the blackboard gives a 63 acre duty at the land. The amount distributed at the head of the canal was a 60 acre duty, a greater amount, in the fore part of July, 1915.

Q So that there is a difference then of three per cent there that was allowed for loss in transit.

A Well, we didn't make any allowances at all. If we had had the information on the losses and inflow, we would have made the distribution equally at the land.

Q I will ask you to state whether or not there was any lands irrigated under the Provo River system between the, what is

known as the Wright Ranch near the head of Provo Canyon and the Midway lower dam in Wasatch County?

A Yes.

Q Do you know whether those lands are covered by any decree?

A They are not covered by any decree.

Q Their right to the use of water has never been adjudicated, and determined then? A No.

Q For about how long a stretch along the river there does that condition exist?

A About twelve miles, that is from the Wright Ranch to the Wasatch Dam. There are some miner users up near the Wasatch dam that have not had --

Q Midway dam, Midway lower dam.

A There are some rights above the Midway lower dam that have not had their right adjudicated.

Q But I am speaking about the particular block of ground, if such exist, for a short distance of some six or seven miles along there where they have never been made parties to any suit, they include Mr. Allen and number of others?

A That is from the Wright Ranch to the Midway lower dam, eight miles.

Q Where there has been no adjudication whatever?

A Yes.

Q Now, is there any other land beside that particular block that has never had their rights adjudicated and which are taking water from Provo River system, and if so, where?

A Yes, there is approximately three hundred acres water from the waters of Deer Creek by a small ditch brought over from Deer Creek into the Provo Valley by Mr. Wilford A. Van Wagonen.

Q Are there any other lands in that condition?

A Then there are some lands below the Wasatch dam, Mr. Ford and Johnsons. There is a Mr. Bradshaw at Mamas with 60 acres, and there is the Stewart Ranch Company that have never had any

adjudication. Then there is the Timpanogos Irrigation Company with about two thousand acres. The Extension Irrigation Company with about eight hundred acres and the Sage Brush Company with some like five hundred acres, if I remember right; and the Spring Creek Irrigation Company are not covered by either of the decrees.

Q That is in Wasatch County? A. Yes.

Q That also, I take it, includes the plaintiff Provo Reservoir Company?

A And the plaintiff Provo Reservoir Company and the Sego Irrigation Company and some other individual users.

MR. WILLIS: At this time, your honor, I just have one question. However, I would like to reserve the right to cross question as to this table in case it is applied to the conditions in the valley above, otherwise, I don't know that I care to go into it.

THE WITNESS: I will say now this table has no reference whatever and is not intended to cover any conditions above the mouth of Provo Canyon. The conditions and requirements are different and the results are different in every respect.

CROSS EXAMINATION by Mr. Willis:

Q You testified, Mr. Wentz, that there were a number of dams in the Provo River where the water was dried up or dammed off entirely. I will call your attention to the Midway upper dam, do you say that the water is at any period of the year completely dammed off?

A Yes.

Q Isn't it a fact there is cobble rock in the ^{bed} ~~bed~~ of the river there and there is water springing up below the dam in that case?

A No, the ground water there is about twelve feet down. We

had had a tight dirt dam in there. Of course we get some return, small seepage maybe through the dam in the rock, but it does not amount to anything? It is a dam made of straw and dirt, hedged in so that it is absolutely tight, as tight as dirt can make it.

Q It is on a loose rock bottom? A. Yes.

Q Cobble rock bottom, that is what it is there, isn't it?

A Yes, it is a loose cobble rock, river rock bottom.

Q Now, it is not the same in character as to the Midway lower dam that is in the same kind of gravel or rock bottom and that it is impossible to dam the water off absolutely?

A There is an underflow through the cobble rock. When I say a tight dirt dam and dammed off absolutely tight, I mean every particle of water that is on the surface of that river bed is diverted. What goes underneath -- the whole valley is moving, for that matter.

Q I just want to understand if that was not the condition that you dammed it off in so far as you were able to do it considering the conditions that exist there? and nature of the bottom of the river where the dam is placed?

A We dammed off on the surface the water that was on the surface. We didn't dam off anything below the surface.

Q And there is water right underneath, or there is water coming up below those dams in each of those cases whenever that attempt is made to dry it off dry, is it not?

A In 1914 with a tight dirt dam in at the upper Midway dam in July, and diversions out between the two dams, and a stream out at the lower Midway dam through the Island pitch, we still had at one time there 17.6 second feet of water going by the dam.

Q Now, for what period --

A All these diversions I speak of and this 17.6 feet of water rising in the river bed between the two dams.

Q Now, what years do you say that so far as your knowledge is concerned that dry dams have been put in the Provo River at the Midway upper dam and at the head of the Island Ditch?

A I could only say of the two years.

Q 1914?

A And '15, yes.

Q You don't know anything about the conditions prior?

A No, only by hearsay.

CROSS EXAMINATION by Mr. Coleman;

Q Mr. Wentz, did you conduct any experiments as to the duty of water on Provo City land to determine your table?

A No, not on the Provo City Land.

Q Did you conduct any experiments on soil tests on Provo City land?

A Yes, I have one soil test.

Q One soil test, where was that taken?

MR. A. L. BOOTH: Are you referring to the city lots or the acreage when you say Provo City land?

MR. COLEMAN: Any of them.

MR. A. L. BOOTH: He has them divided there.

Q What soil test did you conduct on Provo City acreage?

A I took one soil sample from the loose porous soils on the west side of the city from the Eph Smith property.

Q That is the only sample you took on the entire Provo Acreage?

A Yes.

Q On Provo City lots what soil tests did you make?

A I haven't made any soil tests on the city lots.

Q Haven't ~~not~~ taken any borings anywhere?

A No sir.

Q Then your duty recommended there is merely your opinion not based on any experiment or measurement?

A No, it is not an opinion strictly. The soils, I compare them

with other soils that I know that are similar and by the experience of last year.

Q You have not quite answered my question.

MR. JACOB EVANS: Let him conclude his answer.

A By the experience of last year going through the season with the quantities of water that we did.

Q Did you distribute any particular quantity on any particular tract of land to determine its duty, amount required?

A No, not within the city.

Q Merely made a general distribution, did you not?

A The conditions last year, the question was really for me to decide what quantity to use and what was the least quantity because I was facing the time when we would have to cut into the Factory Race, and I did not know what period that would be, or what time we ought to stop raising the duty. I first thought I would keep experimenting tests on two tracts of land, one a light loose soil and another a clay. This would have been a good test, but it would only have give me the facts upon those two particular tracts. Then knowing that the conditions every day -- in communication with the water masters every day, or every few days, I thought it would be better having the whole are in mind and receiving word from them and know how they were getting along, that that would be a more valuable to me than a test on a single tract, and I found that more satisfactory. Whenever a man was short and suffering why, you are always going to hear from him. Sometimes you don't hear from him for a couple of weeks and he is getting along all right. That is the assumption, that is always true in every case with water.

Q Well, merely because -- you were absent from the county great portion of the time, were you not?

A I spent most of my time in this valley last year. I was away a few days, but until the last of August, I don't think I was

away more than two days at a time.

Q That is what I want to get at, Mr. Wentz, ~~is~~ whether you made any experiments or measurements on any tracts of land and observed the crops matured thereby, their condition, or whether you had done anything of that kind to base your opinion on?

A Well, as I say --

Q You state you have not.

A I never followed those through all the way because I thought the larger area, having the whole thing in view, and all the crops and diversified soils would be ~~much~~ much better to me than just one sample on any particular field.

Q Then under what conditions normally would you base this table?

MR. WILLIS: Based on normal conditions.

MR. COLEMAN: What do you call the normal condition and average year?

MR. WILLIS: Average of the weather conditions and soil.

Q Taking all conditions into consideration that you have knowledge of, Mr. Wentz, there are times when there is draught winds things of that kind existing?

A This table in my judgment provides -- as a margin of safety for all things. Now, there was no year in the world we could get worse than last year. We went into the dry season dry, through the first part of June up until about the 7th, we had a rainy cold period, and people were not watering, we could not get them to water. When the river went down to low water they all wanted to water the same day, and we could not water them over for a week or ten days, and some of them two weeks, so we went into our dry condition in the worst condition that we could go, was last year. Take a year like this year we are ~~dry~~ dry, but we have a supply and the people are keeping their lands up full of water, moisture, but last year, as I say, we went into our dry low river dry, and it was probably the 20th day of July or the 10th day of July before

we were fairly well up, caught up with our irrigation.

MR. THOMAS: I want to ask counsel, do you expect to have Mr. Wentz on again?

MR. JACOB EVANS: I expect he will be here.

MR. THOMAS: I am asking you if you concluded your testimony in chief so far as Mr. Wentz is concerned?

MR. JACOB EVANS: We think we have, with the exception possibly using him for Wasatch County, I don't know whether we will or not.

MR. A. C. HATCH: And Summit County possibly.

MR. JACOB EVANS: And Summit County, I don't know as to that.

CROSS EXAMINATION by Mr. Thomas;

Q What do you regard as the margin of safety with reference to the duty of water per acre?

A Supply the land for the worst year that is possible, being safe on the worst year, or an amount of water that will irrigate all the lands properly on the lowe year.

Now, with these figures that we have before us what would you say would be the margin of safety there?

A On an average year.

Q Take all these figures for instance, are these based upon a margin of safety?

A Yes, these will provide for the worst years that we have.

Q Then so far as your judgment leads you, you would say that the duty which you have fixed here is enough to meet any demand ~~2~~ or condition which your experience has developed?

A Yes.

Q Now, you have been careful to say that you did not want this understood as a duty, but that you did regard it as a sufficiency to mature the crops that are raised in this valley?

A. Yes.

- Q That is as I understood it? A. Yes.
- Q Now, have you had anything else to guide you in arriving at this conclusion than just the experience you have indicated here on the witness stand?
- A My experience and what I have read and experiments elsewhere.
- Q You refer to your own experience as a personal irrigator, that is, upon the lands up here on the Provo Bench?
- A Yes sir.
- Q On your own property there? A. Yes sir.
- Q Now, were those experiments conducted under your own system of distribution, or upon prior distributions of water?
- A What do you mean by distribution?
- Q I am referring to the period now that you have had charge of the distribution of the water from the river, do you take your experiments to that period 1913, '14 and '15?
- A No, I have noticed those for a number of years, about the quantity that it takes to cover land and the amounts that land can be covered with. In my opinion that is the only question in duty is to get the land covered properly. It is not a question entirely of what the land will hold, whether it will hold one inch or whether it ~~may~~ will hold two inches. The loss factor in there is as big a factor as the capacity of the soil.
- Q Isn't this also a factor in determining the duty of water as to the amount of water that a particular plant that is being raised requires?
- A Yes, that is a factor, but the loss factor on our low duty soils is a heavy factor.
- Q But isn't that an essential factor as to the amount of water that the plant requires?
- A The total amount during the season?
- Q No, I am asking you if that is not an essential factor to determine the amount of water that a particular plant that

is being raised requires?

A No, not entirely.

Q I don't say entirely, I am asking you if it is not an essential factor?

A No, the conditions -- it ~~is~~ is one of the factors, but the conditions of loss both by percolation and evaporation are so much greater than the difference in the requirements of the different plants. Our greatest plant consumption throughout the year that I know of in this vicinity is nine tons of alfalfa to the acre, makes about ten and a half inches of water that plant would use in producing the nine and a half tons, but it is not -- it is only a small amount in comparison to where there are only 8 tons produced or six tons, the difference is not so great.

Q But still the amount of water that a plant requires, or a particular plant requires is an essential factor, nevertheless in determining the amount of water that is required upon a particular tract of land?

A It is one of the factors, yes.

Q Isn't it an essential factor, you don't irrigate land, do you, for the sole purpose of finding out how much is wasted?

A Well, the essential factor is to keep the soil to proper moisture so those plants can develop.

Q For the purpose of developing the plants?

A Yes.

Q Now then, upon what have you based your experience to determine how much water the various plants that are raised here require?

A I have not made any experiment on what plants require or they consume.

Q During the time that you were conducting or irrigating your land and prior to 1913, were there times when you had a shortage of water under your system, the Provo Bench?

A Yes, there were times in 1905. We had a shortage eleven years ago.

Q During that period did you receive the quantity in acre feet that you have said here was sufficient to mature your crops?

A I don't know.

Q During the years that you did mature your crops are you able to say that you received only the acre feet which you have indicated here to be a sufficiency?

A No.

Q Can you say that during those years when you did mature crops that you didn't have more water than you have herein indicated to be a sufficient amount? A. No.

Q Have you any data at all upon that line that would give us any information in determining what was required to mature crops before you began to distribute water?

A No, I have not.

Q Did the farmers and water users under the Provo Bench Canal where your land is located express satisfaction that the amount which you have herein indicated would be enough to mature their crops?

A No.

Q Do those men there who do irrigate their lands and mature crops say that the amount which you have indicated in acre feet is ~~suff~~ sufficient to mature crops?

A No, I haven't heard them say that it is sufficient.

Q Have you heard them say that it is not sufficient?

A I have not talked with any of them since the table was put on the black board relative to the quantity, and prior to that

7 I have never told anyone except Monday Mr. Ray asked me what duty I thought was proper, and I told him the first column

here that I thought 55, between 55 and 60. Prior to that

time I have never given any information, because I have

not been asked what the proper quantities of water were.

Q You did have charge of the distribution of this water during the last irrigating season? A. Yes sir.

Q And was this the basis upon which you acted last season?

A No, the basis that we acted on last season is as I have outlined. We first went to the 60 acre gross duty or 50 on one morning distribution, then the 60 and then the 65, and when we came to the 70 acre duty, gross duty, we stopped there and maintained the main system on the 70 acre duty.

Q That is substantially as you have given here or are you now speaking -- probably I misunderstand you -- when you refer to your gross duty which you followed last year, you refer to the entire system?

A I refer to the main system as outlined in the table.

Q Now, referring to the Provo bench system as you have outlined in the table, you have indicated that there was a total of 4.38 acre feet furnished, or that is not a fair statement; you have indicated there is an acre feet of 4.38, that would be sufficient --

MR. RAY: That is Provo City acreage.

MR. THOMAS: What is also the Provo bench acreage, Mr. Ray.

MR. RAY: Oh yes.

Q Now, can you say what you delivered in acre feet under that system last year?

A No, I have not figured those systems up in acre feet. They are submitted in the report as the observations were made and discharged at the different times, but have not been figured into acre feet for the season.

Q But would you say approximately, or let me put it this way affirmatively, wouldn't you say approximately the acre feet furnished last year on the Provo Bench system was in excess of 4.38?

A I would not say either way on it without figuring it.

Q What have you done, or what did you do, Mr. Wentz, in trying to determine the character and class of lands under each particular tract to determine whether there was good or bad or indifferent piece of land with reference to the amount of water that it would require?

A My acquaintance with the lands and going over them and seeing them, I made the determination as units. There are bad pieces in lots of the tracts, as I have indicated, for instance in the city tract and north end of the river bottom tract, and number of them have extremely low duty soils that are porous. I give my judgment on these as I have indicated by the coefficient, taking them each as a unit. I haven't a soil survey showing the acre of the lands on each of these good soils and poor soils. We haven't that information. I am submitting this merely as my estimate of the ~~ms~~ difference in those different systems.

Q And because of the lack of information you regard even this table as somewhat inaccurate and inefficient so far as absolute determination is concerned, do you not?

A Well, the absolute determination of course would have to be made on a soil survey, taking every acre and tabulating them up. It is based on what I know of these systems and the lands under each system.

Q But even in the various systems, there is a very wide divergence, is there not? Mr. Wentz, in the character of the soils and crops raised.

A There is a wide divergence in the Provo City soil, for instance, not in the crops raised. The farming is all diversified farming. Now, the Provo City, all we have in town here, for instance, a loose, very loose gravelly loam, shallow and underlaid with porous round river rock. The water runs right off. In the northern part of the system immediately across the road south from the ice plant is one of the most

beautiful soils that I have ever seen. In fact, it is a long ways ahead of the Fort Field and even ahead of the soils on the Lake Bottoms; very light loam, rich in humus and deep. The depth, as far as I could see by the channel there, why, it is at least ten feet deep, sufficient depth. We have those extremes, even, as I say, in the city from bad to the very best.

Q What did you do to determine the amount of these very good tracts and the acreage of the very poorest tracts of land in Provo City for example?

A I have not done anything on determining those.

Q Upon what test did you base your determination of acre duty of water in Provo City for example?

A As I say, on the summing them up as units, and their comparison by a coefficient from all the knowledge that I know of them and going over them and making the distribution according to those coefficients.

Q In determining then the land or in arriving at a coefficient did you determine upon the maximum amount of water that would be required for the poorest soil?

A The poorest soil as a unit, yes, is marked the 115 in the coefficient.

Q And did you, for instance, in determining the portion of water in Provo City, did you determine the good lands, which you have indicated as near the ice plant as being one part or one unit and the remainder of the city would be particular porous and underlaid with cobblerock and the like, as another unit and determine the duty of water for the poorest unit?

A No, neither for the poorest unit or the best, but as a whole unit over the city.

Q How did you arrive then at that average?

A By comparison with the other system. It would not make any difference what coefficient I would have taken, whether it would

have been ten or one thousand. The coefficients were taken just as comparison to use my knowledge that I have in making up that table.

Q That is true, now, when you apply the water to this better land the duty of water would of necessity be very high, or much higher than the duty of water over on the more rocky land that would be evident?

A Yes, very evident.

Q Then, you did attempt to strike an average then between the very low duty and the very high duty lands, that was your object, was it not?

A The object was based -- the duty was based on the system as a unit.

Q That is true.

A Taking it all as a unit.

Q But in trying to get the whole of it as a unit you did have to take into consideration the high duty tract and the low duty tract, didn't you? Do you understand my question?

A No, I don't understand.

MR. RAY: Mr. Thomas, I suggest if you talk about the duty instead of coefficient. He arrived at the coefficient arbitrarily, now, how did you arrive at the duty, that is the question.

MR. THOMAS: That is what I am trying to find out. He arrived at the coefficient in a purely arbitrary way for the purpose of comparison, that is understood, but by reason of that coefficient, as I understand, Mr. Wentz he fixes a sufficiency or duty of water say for the whole of this unit Provo City. Now, that was based upon some investigation, some knowledge of the use of the duty of water to the high lands and to the low lands, to the good lands and poor lands; that is true, isn't it?

A Yes sir.

Q Now then, what would you deem to ~~be~~ have been a duty of water upon this particular porous land.

A I don't believe I understood your question before, that I said yes to.

Q You might make your statement.

A I will try and make that clear. The quantity of water, the total quantity that we used last year is sufficient for the approximately fourteen thousand acres, but as I say, I believe those canals that were losing ought to, in order to be sufficient -- a sufficient amount supplied to them, those losses in transmission made up. I have the total quantity, or approximate total quantity that is sufficient for the whole area. To divide that equally to all the systems wouldn't be right, because there is a difference in the system as indicated by the coefficients. Then this quantity is divided according to the coefficients to get the proper distribution to each particular unit.

Q Now, I understand that. Now then, going to the Provo City, for instance, did you take into consideration in arriving at these figures, or to aid you in arriving at those figures, the loss of water that would occur in transmission under that system?

A Yes, I figured these quantities at the land, or at every quarter section of land that they should be delivered there.

Q Are you able now to state what the loss in transmission would be in Provo City, under the Provo City system?

A No, only in a part of it that we have made measurements on in 1914.

Q So that taking these statements, or these figures, these coefficients as a guide, and this acre duty that you have worked out here as a basis, you are not now prepared to say that that amount of water would be sufficient for Provo City at the point of its diversion, having in mind its system of transmission?

A No, I wouldn't say what those quantities would be at any of the points of diversion, because I don't know the losses in transmission.

Q The same answer would be true, would it not, with reference to the Provo bench?

A Yes.

Q And the same answer would be true practically to all of those canal systems which you have indicated there?

A Yes.

Q You are familiar with the amount of water which was credited to Provo City and the various claimants under the Morse and Chidester decrees, were you not?

A Yes sir.

Q Now, in one of your tables, I have forgotten which one now, Mr. Wentz, you could aid me in this, you refer to and show the duty of water under the various systems.

MR. JACOB EVANS: I think that is part two.

MR. THOMAS: I believe it is.

THE WITNESS: You mean in 1914 or '15?

MR. THOMAS: 1915, it was the one we last used.

THE WITNESS: Page 5.

Q Now, having in mind the amount of water that was decreed to these various parties under the Chidester decree and the former Morse decree, would you say that this acre duty as you have marked here was excessive, having in mind the present system of transmission?

A You mean for Provo City?

Q I will take Provo City for example.

A Yes.

Q Now, upon what do you base that statement? since you have made no investigation as to the loss in transmission?

A The Provo City canals are old canals. The losses in transmission I don't think would exceed ten or fifteen per cent.

They may on the Upper East Union or the East Union, the losses to the extreme end may be greater than that, but in the Factory Race there is an increase in flow, and the City race. I made some measurements a number of years ago and it was a very light decrease in the City race; and the Tanner race, I don't think the losses would be heavy in that. If those were new canals, absolutely new, why, the losses would probably be excessive, but they are all old canals.

Q So then, without any investigation in recent years, and without any other knowledge of facts than you have here stated, you want ~~xxx~~ us to understand that the duty here is excessive or low from Provo City?

A Yes, in my judgment it is low.

Q And referring now to Provo Bench Canal, as you have indicated ^{what} it, ^A would you say as to that?

A I would say the duties are the same at the lands as I have indicated on the blackboard. Wherein they differ why be merely a difference in the two tables.

Q Have you made -- let me ask a general question here -- have you made any investigation of any of these canals that you have outlined upon this table which you have marked Table 7 in part 2 of your report to determine the loss of water in transmission?

A Only the Provo Bench Canal and part of the Provo City system.

Q Then upon what did you base your action in distributing this water that you have had charge of during the past year; did you regard the former decrees since you did not regard, did not make any investigation to determine the loss of water in transmission, what was your basis of distribution?

A Read that, there is two or three questions in it.

Q All right, I will reframe it.

A I will answer it just the way she is.

(Question read)

A Now, stopping there, I will answer that far. No, we did not regard the former decrees in any way, disregarded them entirely

Q Let me ask you, you disregarded them entirely?

A Yes.

Q Now, can you advise as to what authority you had for disregarding them entirely?

A Yes.

Q I would be pleased to learn.

MR. JACOB EVANS: What part of your report are you referring to now?

A Part 8.

MR. JACOB EVANS: What page?

A Page 2. The stipulation entered into between the parties in this case in the spring of 1915 reserve to the different rights 299.33 second feet and as shown in the testimony, in my testimony of yesterday, there was reserved of this amount to the defendants in the Utah Valley below the mouth of Provo Canyon, 288.4 second feet. This 288.4 second feet was designated by the defendants and the plaintiff in this cause as the amount reserved for the defendants, and upon this reservation the commissioner considered this was sufficient for all the needs of those defendants, for this land as indicated was sufficient for the use of all the defendants. It would be absurd to consider this amount as divided on a 37 acre duty to one defendant and on a hundred or ~~an~~ hundred and five acre duty to another defendant with exactly the same classes of land. If the one party needed a 37 acre duty, then the other party that would necessarily have been raised to a hundred and hundred and five acre duty also needed a 37 acre duty, and the amount would necessarily need to have been five or six or even seven hundred second feet in this distribution of 1915 in order to give all of the parties a sufficient amount at the 288.4 second feet, and not allowing

an extremely low duty such as 18, 20, 30 or 37 second feet. We disregarded the distribution as outlined in the table, tabulation portions in the Morse decree, and made the distribution equal to each party covering this amount.

Q Now, Mr. Wentz, you then assumed somewhat judicial powers, did you not, when you undertook to do that?

A No.

Q You regarded then the power you exercised in setting aside the decree of this court as purely or entirely within your authority as commissioner?

A No, not at all, the decrees were set aside by the stipulation.

Q And when were you advised that the decrees were set aside by the stipulation?

A By the stipulation itself.

Q What authority have you had to make that statement?

A I had the --

MR. JACOB EVANS: Just a moment, read the stipulation It speaks for itself.

MR. A. C. HATCH: Object to that as not a proper question.

MR. THOMAS: I think it is a proper question. Mr. Wentz has exercised extra judicial power, it seems to me.

MR. A. C. HATCH: He followed the stipulation.

MR. THOMAS: I don't think he did. If you want to argue that we will let the witness retire and take that up.

THE COURT: Gentlemen, I don't think that is before the court now, there is a question asked and if it is objected to I will take up the objection. I don't understand the question myself, possibly Mr. Wentz does, or the counsel who objects to it. Now read the question.

(Question read)

MR. A. C. HATCH: My objection to that, if the court please, is that the witness has just stated that his authority

was the stipulation itself. Then the question is what authority have you for making that assertion.

THE COURT: Yes, that is the question.

MR. A. C. HATCH: It is asking the witness unnecessarily, I take it.

THE COURT: I don't understand what you are asking, what authority he has for his testimony.

MR. THOMAS: The question may be somewhat obscure, we are not asking the witness, because that is farthest from my mind -- we have the statements, he did state it yesterday, but we take that phase of it up a little later.

MR. A. C. HATCH: I don't so understand the witness.

THE COURT: Nevermind, it is not necessary to argue what he has said. The court remembers what Mr. Wentz said.

Q Now, Mr. Wentz, you made the statement here several times that the amount of water which you have herein indicated was sufficient to mature crops -- that is, I take it from that that you ~~may~~ mean any crops which might be raised or cultivated upon the lands; do I understand that to be your statement?

A That is based on the crops raised, generally raised in this section of country. Now, for instance, wheat, ~~an~~ a man had a 20 acres and planted that all to wheat one year, this would be more than sufficient twice more than sufficient, or nearly twice, or on account of not being able to use that water after the wheat crop was off. If the reserve were true, say that each farm was planted to alfalfa on a loose porous land or a whole system, say the Provo Bench area of 4333 acres was all planted to alfalfa, every acre of it, this amount would not be sufficient, but we have not-- there is no possibility of that being done, and it is based on the general farming throughout the country, and diversified crops. One man may be at the end of a system with a ten acre ~~map~~

tract, plant all of his tract to alfalfa in direct reverse to the one that planted all to wheat, but those conditions I cannot see how we can provide for, and they generally provide for those things amongst themselves by exchanging water one with the other to meet those conditions, and where we run with a margin of safety to supply the whole unit with the proper amount of water is as near as we can get to the actual quantity.

Q You have referred again to the margin of safety, could you put that margin in percent.

A That depends on the year. A year where we have lots of rain, why, there isn't so much water used. Where we have small amount of rain, great deal of water is used, but the table is intended to, and in my judgment is sufficient for the first year.

Q But now will you answer the question, or could you put that margin of safety that you have referred to in percent, having in mind the general conditions as they exist here in this valley, rain conditions, in fact all matters of climatology and also the various conditions of the soil?

MR. A. L. BOOTH: Do you intend that margin for a dry year or wet year?

MR. THOMAS: Let the witness determine it himself.

A No, that depends entirely on the ~~ms~~ season.

Q I have said taking all those things into consideration matters of climatology as well as matters of soil, can you tell me in per cent what those figures would be?

A The soil condition does not enter into that, the soil conditions will remain just the same, but the difference above a low year that will be required will depend entirely on the season.

Q That I understand it depends upon various conditions. Now, I

have asked you again, I will ask you now, taking all those things into consideration ~~was~~ can you put that margin of safety into per cent, whether it be ten per cent or twenty per cent or thirty per cent margin?

A No, that is a factor that changes according to the particular conditions existing at that time.

Q Have you taken into consideration in estimating the acre duty here as to the amount of water, for instance, that will be necessary to mature a particular crop, say alfalfa?

A Yes, as I explained a moment ago.

Q And have you taken into consideration that up to a certain amount or certain quantity of water used a certain crop would be raised in tonnage with increasing that acre feet? you would thus increase the tonnage; that have you taken those things into consideration?

A Yes, and still increasing the acre feet the crop production would decrease.

Q Beyond a point of safety?

A Yes.

Q Now, have you discussed that in your figures?

A Yes, I take those -- all those conditions under -- include them in the table. The table is based on the amount that it requires to make an irrigation, make an application on and saturate that soil, and the time that soil will stay at proper ~~margin~~ moisture content by the growth of crops. Putting a large amount of water on in an application does not leave you any more water in the soil than a small amount provided you get the application over, whether it be on a two foot soil, or a soil that is two feet deep and loose and sandy, if you put two inches on or if you put twenty feet on you have got just as much water left twenty-four hours after the irrigation in either case. The quantity doesn't make any dif-

ference. It is only the capacity of the soil to hold that water.

Q Are you familiar at all with the investigations or experiments that were conducted by Mr. George Swan with reference to the duty of water in Provo City?

A No sir.

Q Referring to your table there, Mr. Wentz, I note that in column 2 and in column 3, for instance, during the hottest season of the year, you have increased the duty of water, is that in consonance with the general reported facts from various agricultural stations, and from experienced men in that regard?

A The crop consumption is heaviest about the first part of July until the 15th of July, but the increased amount in the first column or lower duties is because of the difficulty in making the application, so great a loss of water by deep percolation.

Q Isn't it true there is less irrigation in comparison at the earlier season than there is in the later season. In other words, isn't there more water consumed by irrigation in the periods designated in columns 2 and 3 than in column 1?

A More water consumed by the plants.

Q In irrigation more water applied to the land?

A No, the first irrigation is the heavier irrigation, and as you go into the summer your irrigations are lighter, your applications are lighter.

RECESS.

Q Referring again to your columns 1 and 2, taking any one of those columns ^{which} with total ~~3~~ 4.38 acre feet, take the first one there, Provo City acreage, virtually 60 per cent of the water would be applied during the first two applications, would it not, Mr. Wentz?

A I don't understand your question.

Q Well, allowing 4.38 acre feet for the entire irrigation season, wouldn't you apply under those figures practically 60 per cent of your acre feet during the first two irrigations?

A During the first ~~x~~ two periods, you mean?

Q Yes, if I said irrigation, I meant as indicated by those columns.

A In the first two periods the total would be 2.37, a little more than half of the total.

Q So far as the application there is concerned then, that would lower the duty to about one second foot to every forty-five acres, would it not?

A No, it wouldn't lower the duty any lower than is shown?

Q Would you say that the duty of water per acre would be the same throughout the entire season, having in mind these applications?

A No, if I had said that the time would have been from May 10th to October 1st, just one column with the duty on.

Q And during the earlier periods, say during the first two periods which you have indicated so as to get the greatest efficiency, you have to lower the duty of water, do you not?

A The duty is lower at that season of the year than it is later in the year.

Q And that is the period when the water is most needed?

A Yes.

Q Now, on those figures that would reduce the duty to about 45, wouldn't it, as against the figures you have given?

A No, it wouldn't reduce the duty at all.

Q Are you familiar, Mr. Wentz, with the report of Herbert Wing, the acting state engineer of Idaho, issued in 1913 and 1914, and having specially in mind that part under the investigation of Mr. Don Bark?

A I am familiar with Mr. Bark's investigation there and his

final conclusions on the duty of water on those tracts in Idaho.

Q Do you recall his descriptions of those tracts as being gravel and very gravelly, medium clay loam and sandy and very sandy, uniform clay loam and the like?

A Yes sir.

Q Would you regard such a description as he has given of ~~very~~ very gravelly soil as applicable to soil here in Provo being very gravelly?

A Not in Provo. The soil as I interpret his very gravelly is the same as the soil we have near the mouth of Provo Canyon on the upper end of the East River Bottoms Company. The soil of Provo is a gravelly loam, that is, it is a loam with some gravel in it.

Q Then you wouldn't call it in any version gravelly, it would be still called gravelly then, would it?

A The Provo areas?

Q Yes.

A The Provo area in the city here that I designate as gravelly loam is a loam with a little gravel in it.

Q Do you regard the investigations of Mr. Don Bark as authoritative?

A Yes, his conclusions.

Q Would you say that there is any soil here in this valley that is similar to the soils which he designated in his report to which ~~we think~~ I have referred?

A As very gravelly?

Q Medium clay loam, uniform clay loam, very sandy and impervious clay loam?

A Yes.

Q Have we any such soils here?

A Yes, we have such soils.

Q And within this district?

A. Yes.

Q Would you say then that the conclusions which he reached on soils in Idaho similar to the soils here were correct?

A Yes, that is, I say his conclusions. Don't understand me now to mean that some of those tests that I say would apply here, but I say the conclusions of his report that two acre feet for medium good soil was ~~sufficient~~ sufficient for a season and that for the very heavy soils that four acre feet were sufficient.

Q Do you recall his finding that so far as alfalfa was concerned on medium clay loam that 4.49 feet would be required, and on gravelly soil as high as 11.2 feet?

A I don't recall those two tests.

Q I refer you to page 87 of the Tenth Biennial Report of the State Engineer to the Governor of Idaho, Herbert Wing, Acting State Engineer, and the page 87 referred to that part that was prepared by Mr. Don Bark, and I direct your attention to the figures on the lower part part of page 87 under the sub heading "Alfalfa Etc., 1910", those figures are as I have just indicated them, are they not?

A 4.49 acre feet.

Q Now running your thumb just lower there in the column you will find another figure that I gave .

A 1.3 acre feet producing 3.3 tons. 1.87 acre feet producing 3.56 tons. 2.1 acre feet producing 4.74 tons. Very gravelly. 11.2 acre feet production 4.2 tons? 6.92 acre feet 3.78 tons. 8.4 acre feet 4.85 tons. 12.98 acre feet 4.6 tons.

Q Those are the figures which I covered, like I covered down below there, would you ^{say the} soil here in Provo with its light surface and its deep sub stratum of gravel was not a very gravelly soil?

A Yes, this is not a very gravelly soil. The Provo area within the Provo City area is a gravelly loam as I have designated it.

Q You think then you have given as much water to this soil as

was found necessary to similar soils in the state of Idaho, as given by that report?

A I have given more.

Q In what particular?

A The average as the total for the season that I have designated in the table, the least is 2.96 acre feet. The greatest amount for the season except the city lots is 4.85 acre feet. Mr. Bark in his conclusions on investigations of the duty of water ~~in~~ in Idaho finds that on the medium soils that two acre feet is sufficient and on the extremely light and porous soils the extremes that four acre feet is sufficient.

Q Have you been able to -- were you through?

A No, not quite.

Q Pardon me, go ahead and finish.

Q In no one of the units in the Provo Area that I have designated does it come under the class that Mr. Bark designates as requiring as much as four acre feet.

Q What can you say of your own knowledge, Mr. Wentz, as to the productivity of this soil giving the same conclusions in tons for prove that Mr. Bark for his Idaho investigation.

A I don't understand your question.

Q Let me reframe it then. Can you say what this land did Produce or will produce in tons per acre as Mr. bark did in that report?

A No, I haven't kept any of that data, production of crops.

Q You have absolutely no data to support your conclusion as Mr. bark furnished by his conclusions?

A No, the amount of water and the amount of production are not always in direct ratio. Fertility of the land, class of the land and the cultivation of the land, many things come in as factors of production. For instance, in the growth of trees, a peach tree that is irrigated often and not cultivated in the Provo area will make from three inches to ~~as~~ seven in-

ches of new growth. One that is watered properly with proper amounts at periods of two weeks and properly cultivated will make from five to seven feet of new growth against the three to seven inches of growth on the land that is not cultivated. The growth factor and production is not in direct ratio to the amount of water applied.

Q Don't you suppose that Mr. Bark took those same factors into consideration that you are now announcing.

MR. THURMAN: We object to that, don't know what Mr. Bark --

THE COURT: Objection sustained.

Q Isn't it to be presumed these governmental reports are based upon similar factors as you have here in indicated? Never-mind what about this wasting time.

THE COURT: If anyone objects to it, the objection will be sustained.

MR. THURMAN: I object to it.

THE COURT: The objection is sustained.

MR. THOMAS: Let them make their objections then.

Q Don't those reports that you have just -- you have in your hand, show that the maximum amount of water was used during the periods which you have designated as your 2 and 3 in your column there, referring to pages 103 and 109.

A On page 103 for the fields of grain, the amount used in May was $\frac{13}{100}$ thirteen hundredths of an acre foot. The amount in June was $\frac{68}{100}$ of an acre foot per acre. The amount in July was $\frac{56}{100}$ of an acre foot per acre, and in August there was $\frac{9}{100}$ of a foot per acre, and in September the first to the 15th there was nothing used. The total for the whole season was 1.49 acre feet per acre.

Q What proportion of that was used in the months that I have indicated?

A In May there was -- I omitted one in April, there was .009

Of practically 1/100 of a foot feet per acre used. About an eighth of an inch. The percent in April was 66/100 of one per cent. May 9.28 per cent; June 5.92 per cent; July 38.1 per cent; August 6.05 per cent. The greatest consumption was in the month of June, being 45.9 per cent, practically the same basis as I have used.

Q Give the figures of July and August.

A July is 38.1 per cent; August 6.05 per cent.

Q I direct your attention to page 109 of this samereport, showing the depth, the summary depth of water in feet applied during the periods indicated?

A Do you wish those read into the record?

Q Yes, and compare them with your own.

MR. THURMAN: I don't know what it is, but we will object to it unless there is some correlation..

MR. THOMAS: Henceed not read it now.

Q Just read those figures, Mr. Wentz.

THE COURT: Do I understand you have objected to it?

MR THURMAN: Yes sir.

M. THOMAS: You may submit it to Judge Thurman, and if he objects I will pass upon it.

MR. THURMAN: I object unless there is some correlation of soils and land.

MR. THOMAS: Very well, I will take it up some other time. That will be all on that matter then.

Q Mr. Wentz, taking your estimates there as the basis of water duty, are you able to say what per cent of the water would be used in the respective months beginning with May and following through June to September?

A No, not without making a claculation for each month in percentage instead of acre duty.

Q Would you say that a larger per cent would be used in June and July and August than in April and May?

A In July than in April and May, oh yes.

THE COURT: Let me call your attention, I don't know whether you noticed it, as I understand it there was no reference made to what was used in April in this table, is there?

THE WITNESS: Yes, the column five provides for the month of April, so much of column 4 as may be necessary for the time October 1st to May 10th.

MR. THOMAS: Then there was reference made one time by the witness to the early irrigation of March.

THE COURT: That is a non irrigation season.

MR. THOMAS: Yes, generally would be so.

Q Am I to understand then from you that a heavier per cent of the water is need, say for July than for any other month?

A No.

Q Would you say a greater per cent was needed in June?

A The greater per cent is needed from May 10th to June 20th, as the table shows.

MR. RAY: Now, your honor please, I would like to have that cleared up as to what is the basis of his comparison as to per cent; whether Mr. Thomas means to compare the month of May with the rest of the year, or any other one of these designated periods?

MR. THOMAS: Obviously we are discussing the designated periods, during the irrigation season.

MR. RAY: Than any other one period, you mean?

MR. THOMAS: Yes, during the irrigation period. Some ^{to} periods are obviously such as, require more water.

MR. A. L. BOOTH: He has not the month of May separated there. He starts with May 10th.

MR. THURMAN: That is part of May, isn't it?

MR. A. L. BOOTH: Yes, that is two-thirds, but you asked about May.

MR. THOMAS: I am asking still about May.

MR. A. L. BOOTH: Object to it as not cross examination.

THE COURT: Object to what?

MR. A. L. BOOTH: To his asking about the month of May.

THE COURT: Ask a question, then you may object to it. I think the last question has been answered.

MR. THOMAS: I think it has.

THE COURT: Ask your next question.

MR. THOMAS: He doesn't know what he is objecting to.

MR. A. L. BOOTH: No, I don't because we don't know --

THE COURT: Gentlemen, the court will require you gentlemen to address yourselves to the court, there is nothing before the court. The court has directed the counsel to ask his next question. You may proceed, Mr. Thomas.

Q Would you say, Mr. Wentz, that the investigations made as recorded on page 109 of Mr. Bark's report were made under conditions similar to those existing here in this valley?

MR RAY: Object to that, your honor please, as calling for hearsay.

THE COURT: Objection is sustained.

MR. THOMAS: Exception.

Q Upon what did you base, or let me put it this way, what did you include in municipal uses of water when you answered Mr. Evans with reference to the amount of water that would be required here in Provo City.

A I have segregated the amount to Provo City in the amount of land actually irrigated within the city on the lots in the several blocks and the amount designated as the Provo City Water Works includes the amount to the Water Works system for culinary use, stock watering and sprinkling of streets and lawns, and such uses that are not covered by the irrigation

system within the city by ditches.

Q Have you made any other calculation than that that you have given to Mr. Evans on direct examination, that it would take one second foot to each 1850 inhabitants for all municipal purposes; that is, have you designated, divided and subdivided the various uses that water is put to in a municipality?

A No, I have not made a subdivision.

Q Upon what did you base your estimate?

A That is based upon the amount usually awarded to cities at the maximum requirement based on reports.

Q Do you know how many miles of streets there are in Provo?

A No.

Q Do you know how many miles of sewer there are here?

A No.

Q Do you know how many drinking fountains there are?

A No.

Q Do you know how many public horse troughs there are?

A No.

Q Do you know how many square yards of lawn that require sprinkling in this city?

A No.

Q How many or what requirements there are made upon the city for the use of water in the city cemetery?

A No.

Q Nor in the schools?

MR. A. CL. HATCH: Isn't the cemetery in the acreage?

MR. THOMAS: That may be, but I think not.

MR. JACOB EVANS: It is under the pipe line I think.

Q Do you know what is required by the hospital, Provo Hospital, State Mental Hospital from Provo City in water?

A No.

Q Do you know whether or not Provo City is required to furnish water to any non resident adjacent to the city?

A No, I don't.

Q Do you know what water is required as a fire protector, which you generally call a fire reserve for a city of this size?

A No, I have not segregated this amount as I state, but cover everything. The amount is sufficient as designated by , as given in the report as a maximum amount per capita for cities of 350 gallons for each person every twenty-four hours.

Q Now, you have in mind the reports that have been published from time to time as to the water requirements in the large cities, have you not, more thickly populated centers?

A Yes.

Q Have you taken into consideration the civic conditions that are existing in the various cities from which you have taken your report and compared with this city?

A It has been sometime since I went into that matter, and looked it up I think four or five years ago. As I remember at the time I made up this table I established that from my recollection of the maximum amount that would be required for a city of this class.

Q Purely a matter of memory then? Upon which you made your estimate?

A Well, yes, it is a matter of memory, it is a matter of knowledge it is not exactly memory.

Q And have you made any particular investigation as to the conditions in this city here as to its requirements for municipal purposes?

A No.

Q You haven't made any investigation as to that or taken into consideration the peculiar conditions of this city in making your statement one second foot would be sufficient for 1850 people?

A I don't know of any peculiar --

Q Just answer the question yes or no, Mr. Wentz, and make your statement afterwards.

A I don't understand the question as stated.

Q Just read it again.

A What you mean by peculiar.

Q Well, local conditions then?

A I don't know of any peculiar local conditions.

Q Now, will you answer the question.

MR. A. C. HATCH: If the court please, I submit that he has answered the question. He was asked if he had taken into consideration the peculiar local conditions of this city in making this computation, he said he doesn't know of any peculiar local conditions existing.

MR. THOMAS: That may be deemed an answer, I don't think it is.

THE COURT: You may have it answered further, if you desire .

Q Can you make any further answer to the question?

THE COURT: It is in substance no. He has not of course if he doesn't know of any he could not take them into consideration.

A No, I cannot make any further answer to the question.

Q Mr. Wentz; in making your calculations did you take into consideration the waters that came from what are designated as the East drain or East drains here in this city -- I think that I have given them the proper name?

A The water that come from the East drain or anywhere else don't make any difference with the duty table, no consideration of the source of supply at all.

MR. CORFMAN: I just want to ask one or two questions.

CROSS EXAMINATION by Mr. Corfman:

Q I see in your report that you designate the Factory race upon which the mills are situated as being constant 19.30 second feet, except in time of scarcity. What do you mean by that designation, time of scarcity?

A What part are you reading from?

Q My copy is not paged. It is your report of 1915, part 8, page not designated in my copy?

MR. RAY: Page 6.

A I followed the outline of the preferred right use as defined in our statute, Section 1283 X 27 that use for agricultural purposes and for domestic purposes have preference over use for all other purposes and that a factory race is subject and is secondary to domestic and also to agricultural rights.

Q That is, you treated it as such?

A Yes, and treated it as so.

Q You treated it as such? A. Yes.

Q And you did during the season of 1915 in times of scarcity take from that 19.30 second feet portion of the water that the mills would have had, and applied it for purposes of irrigation? A. Yes sir.

Q And for how long a period?

A It was taken for a period in August.

Q About how long?

A Well, we were short on the Factory race in July, but the amount was sufficient August third, and I don't remember the deficiency, how long it existed through August.

Q And how much did you take?

A August 4th the amount was 39.4 second feet;

August 5th 27.72 second feet;

August 6th 35.14 second feet;

August 7th 32.48 second feet;

August 10th 23.45 second feet; in the morning-- in the

33.25 second feet.

August 11th 29.68 second feet;

August 16th, 30.24 second feet;

August 18th, 31.5 second feet;

August 25th, 31.5 second feet. That is all the measurements I have for the month of August.

Q Did you distribute that water to the irrigation rights under the Provo City system, or did you distribute it pro rata among the several users in Utah County Valley?

A The amount, as I have stated, when we reached the 70 acre duty, we held the canals there and the deficiency was borne by the Factory Race whenever it occurred.

Q And pro rated among the other water users?

A No, I didn't take anything from the Factory Race, the Factory Race bore the deficiency. The amount of 70 acre duty to the other canals was given and they were held there, whatever deficiency there was was borne by the Factory race.

Q That was given to the other water users pro rata?

A No, it wasn't giving it to anybody.

Q Well, they had it then?

A How is that?

Q They had it?

A They had 70 acre duty, the main system.

Q Now, in turning the water to provo City, did you supervise and control it in the distribution after that, before it was applied?

A No, only delivered the water at their headgate. There is a brick yard at Provo. The distribution through the city was made by the city water master.

Q Now, going to the Upper East union canal, do you know the length of the canal?

A No, I don't.

Q Approximately .

A Four miles.

Q It heads at the mouth of Provo Canyon?

A Did you say the Upper East Union?

Q Upper East Union, you misunderstood me.

A Yes, the Upper East Union is nearly nine miles long.

Q And did you have any complaint from the water users under the Upper East Union Canal system in 1915?

A Yes.

Q As to scarcity? A. Yes sir.

Q And were you advised that there were crop failures under that system during 1915?

A I knew they were suffering on the lower end in 1915, and investigated and found the cause. It was internal distribution, not the quantity of water at the head.

Q What do you mean by internal distribution being the cause?

A On the first complaint I went over the upper end of the canal and there were a number of gates that were leaking just a small stream. In fact, every gate I noticed along was leaking a small stream and there was about a foot and a half, one and a half second feet going over the spillway which is located about a mile below their rating station. I reported this to their water master and told him to stop those leaks and take care of his water and if he found after doing that and getting along that he was not irrigating his crops, or did not have sufficient to irrigate his crops, that I would make the amount up until he did have sufficient. The second complaint was about two or three weeks later and he told me that he was not getting along on the lower end, that he was still short. I investigated conditions on the canal. He was diverting one stream about a mile and a half north of Provo and the other was going to the lower end of the stream. There was approximately twelve and a half second feet a total in the canal. Of this amount 60 per cent was diverted out of the opening and smaller

stream of 40 per cent was allowed in the canal to carry it to the lower end; or the land at the upper end right adjacent to the canal with no losses was being given one and a half times of the amount of water going to the lower end with its ~~exif~~ occurring transmission losses. I reported this to the company and advised them to put in weirs, put in two weirs so that the water master could make a division of that water, and when taking out the stream at the upper end he could divide it so as to give to the people on the lower end of the system their share of the water. I gave them an estimate and found the -- got an estimate from the Beebee Lumber Company what they would make the weirs up for, and told them if they would order the weirs, put them on the ground that I would help them install them. This was not done, and I could do nothing more, and felt -- and did not feel like giving them any more water at the head until they instituted some proper system of distribution.

Q You are not then prepared to say what the results would have been if those weirs had been installed?

A If those weirs had been installed and the proper distribution made in the system and those people were still short, I would have turned them enough water to make up the deficiency.

CROSS EXAMINATION By Mr. John E. Booth.

Q Mr. Wentz, have you made any calculations from the table and in connection there with what amount of water would be required to supply say the first column on the acreage that you have estimated? A. No.

Q Can you do that?

A I can do it on the acreage that I have used the ~~xxx~~ 13,810, but I cannot say how close that acreage is, it is submitted by different parties in the case.

Q Have you that calculation that you can give me?

A No, I haven't made it, I can make it for you.

Q And soon, or I would be glad to get that, I want to get some idea what amount of water in the river would be required to supply those estimates you have on your table?

A I could not make it on account of the different ranges of duty. It would take some time to make it because there would have to be a calculation for each area.

Q Could you give it approximately?

A No sir.

Q So that you don't know whether the water that was in Provo River in 1915 would supply the amounts that are used in the tables for acreages as you have it there?

A I have not figured the quantity, I cannot say one way or the other what this quantity is, I cannot express an opinion that I don't know anything about.

Q You have so many acre feet.

A Yes.

Q And I didn't know but you might have calculated the amount of water that would be required to supply that much acre feet under the several columns that you have there.

THE COURT: For that to be of any value you would require the acreage.

MR. JOHN E. BOOTH: I understand he has an acreage he can use.

THE COURT: How much acreage?

THE WITNESS: 13,810, that would necessitate calculation on each one of those, take some time.

Q I see it would, I didn't know but you had it.

A No.

Q The reason of it is in order to make it applicable. If I knew what amount of ~~what~~ water that would supply those demands here I would then know at once whether I was satisfied. I haven't any cross examination on that branch without a little

more information with regard to that point. Can you let us have those figures later?

A Yes, I can figure them for you on the acreage as used in the report.

Q That would be satisfactory. One other question. Did you take into calculation at all, take the East River Bottoms, you have 110 of a coefficient there.

A Yes.

Q You recognize the place, the upper place of Peter Boyce, do you, you know where that land is?

A Yes.

Q And Ferguson's? A. Yes sir

Q That is land that would require about the most, isn't it, of any of that division?

A The land above the south line of Ben Richmond's, from there up requires the most.

Q Now, take it there, you require a vast amount of water there?

A Yes.

Q To supply? A. Yes.

Q Now, did you calculate or take into consideration the fact that that great loss rises, say half a mile or little below, little more than that below and is again used by other irrigators?

A No, I have not figured any of those quantities in.

Q Well, do you recognize that as being the fact?

A There is a point a line somewhere crossing the river bottom-s below which we get a return and above which we lose. It is lost, and I have never been able to determine where that line is.

Q Have you been through my place there?

A No.

Q Have not examined the crops there?

A No sir.

Q That are on mine? A. No sir.

Q' I thought perhaps you had taken that into calculation. I wanted to know what was the result of it if you had.

A No.

MR. JOHN E. BOOTH: I believe that is all the cross examination I have.

CROSS EXAMINATION by Mr. Huffaker;

Q Mr. Wentz, on your direct examination did I understand you to say that you didn't know whether or not there would be any loss in transmitting the water from the reservoirs down to the plaintiff's point of diversion?

A I don't know what the quantity of loss is.

Q There would be a loss by evaporation and seepage, however?

A Yes, undoubtedly some loss from evaporation.

Q And then with the reservoirs up there, would^{n't} the construction of those reservoirs interfere with the intermediate flow.

A You mean by the intermediate flow the flow between the high water and the low water?

Q Yes.

A Well, if they were storing water at that time in the reservoirs the intermediate flow would be less.

Q The reservoirs according to your opinion should be filled during the high water then?

A Yes, they should be filled at times when the water is not appropriated by the whole users for irrigation direct from the river.

Q And wouldn't it interfere in other ways -- now, for instance, supposing there were only a half a second foot of water running in into that lake of 50 acres there if the reservoir were not there, that half a foot of water would go directly down into the main river, but by the reservoir being there, and spreading that over the area of 50 acres, it is likely that the greater ~~or~~ portion or all of it might be lost in evaporation

isn't it?

A No, I will explain that in my own way, if you will allow me.

Q That is all right.

A I was under that same impression, that the water flowing into the lakes at the head of the river, the surface flow, visible flow, should be counted as a part of the natural flow and if the lakes were not there it would go on down the river. On investigation of Wall Lake -- and I may say before that the strata of that country dips towards the Weber, and the whole lake district, the strata or bedding planes^{are} all dipping away from this water shed, and they are not broken, so that any water that falls -- goes into the earth, instead of going to the Provo Shed, follows the plane the opposite way, follows the dip of the planes towards the Weber. This might not be true if the vertical seams in the -- through the section were open. The height of water above the opening of those seams below the lakes would force that water back through the vertical seams into the Utah -- the Provo River section, but I examined the vertical seams all over the section of the country in which I travels, and with one exception I found them all closed, they are closed at both ends as far as you can follow them, so that the sub-surface water follows, must follow the bedding plane. It is true that there is some water following those planes now when they pierce the sub-surface side of those lakes they may be discharging quantities of water into the lakes and in the form of springs and seeps, but on the other end the bedding planes on the opposite side of the lake may be carrying that same amount or a greater amount through to the Weber watershed. To determine this fact we made a test on the Wall Lake with the outlet valve closed. On August 27th, at 6:40 P. M. The gate in the outlet pipe was closed tight and no water allowed to escape. Three wood hubs were

then set around the shore line of the reservoir as follows; one in the southwest corner, one in the northwest corner and on the east side. These three hubs were set so as to have a check against any wind or wave action and was very carefully set flush with the water surface while the reservoir was comparatively calm. On August 29th at 4:40 P. M. after these hubs had been allowed to remain undisturbed for forty-six hours, they were observed with these results. At the hub set in the northwest corner the water surface was found to be $2/100$ of a foot or one-quarter inch below the top of the hub. At the one in the southwest corner the water surface was found to be three and a half hundredths of a foot or seven-sixteenths of an inch below the top of the hub. At the one in the east side, the water surface was found to be three and a half inches of a foot or seven-sixteenths inches below the top of the hub. Taking the average draught of ~~300~~ three hundredths or three eighths of an inch from the surface area of fifty acres equals 1.74 acre feet loss in 46 hours, or is equal to forty-five hundredths feet flowing continually. There was no visible inflow to this reservoir at the time this experiment was made. ~~Exam~~ Some similar observations were made on Tiral Lake with the same result. These lakes actually lost more than the inflow. The outlets are lower than they were originally and the surface area is relatively smaller, therefore when these lakes are down and losing this quantity of water they are even losing less than they were originally. I think that answers your question.

Q Well, as I understand you Mr. Wentz, the water is going off into a different water shed because of the strata of the rock; how would you account for this loss, where does it go to?

A It follows the bedding planes undoubtedly to the Weber River.

Q Then there might be a half a second foot of water running into

one of those lakes? and because of the reservoirs being there it might go off into the Weber where otherwise it would go down the Provo, isn't that true?

A No, you have the wrong idea. These lakes are losing this half a second foot approximately when they ^{are} even down below their old natural surface.

Q Don't they lose more when they are covering more space when they are filled up well?

A Yes, they undoubtedly lose more, but that is storage water. Didn't make any difference if they lost it all, the Provo River at the stage of the year wouldn't be any different. Say on June 1st if those reservoirs lost all their storage in one day and it went the other way it wouldn't make any difference to the Provo, because on that day of June 1st the overflow from that lake would have been gone.

Q So you don't think that these reservoirs would make any difference with the surface water?

A Make a difference exactly, the difference of the water they store, the amount of water that they store at the head of the lake, there is that much less water going into Utah Lake in acre feet.

Q Is there any way of determining the exact or approximate amount of water going into those reservoirs either surface flow or percolating?

A At what stage do you mean?

Q Well, take it during, in the intermediate or after the low -- during the low water?

A We have -- at least Mr. Pratt made the measurements of the visible surface inflow to those lakes and that amount was deducted from the amount turned from the lakes and counted as natural flow from the Provo. For instance, if we found they were -- there was three second feet surface flow going into the lake, and wanted to deliver fifty second feet to the Provo

Reservoir Company, why we would turn from the reservoirs the 53 second feet and allow the three second feet to go to the old users.

Q But you only measured the surface flow to deduct that amount?

A Yes.

Q Isn't it a matter of fact there is a sub-surface flow there coming from the big snow banks above?

A Yes, but it is a fact that there is a sub-surface flow going out the opposite side of the lake as I have explained by this test to the Weber water shed.

Q But you cannot determine the amount, of course of the sub-surface flow into the lakes, could you?

A We would determine the difference between the sub-surface inflow and the sub-surface outflow by measuring the surface inflow and keeping the gate valve closed.

Q Well, did you make a test to determine that?

A No.

Q Now, there is one other question, I didn't understand Mr. Wentz just what you meant, you said it didn't make any difference in irrigating whether you put two inches of water on or ten feet.

A I will illustrate that with this map. This is a cylinder approximately five feet in depth, and it is in exactly the same condition as the soil. The opening or the outlets from the soil are in the bottom to the sur-surface. In filling this cylinder it will hold just so much water, takes five gallons or ten ~~gms~~ gallons or fifteen gallons of water, take up two inches in soil. You can pour into that ~~at~~ soil just as much as you want to and as fast as you pour it in it goes out. It will hold just so much of it, will only hold two inches. You can put on as much as you want to and it will still hold the two inches, whether it be one day or whether you keep it on for ten days or two months.

- Q You are assuming it is thoroughly saturated?
- A No, it never gets saturated. It produces from 40 to 60 per cent of saturation. It cannot be saturated unless it has an impervious place there to hold that water from escaping. The water is moving through the soil and most of our Provo soils here in the Provo area are coarser as you go down and the outlet openings are a great deal -- have a great deal better capacity for carrying off the water than the inlet openings.

5:00 P.M., Recess to 9:30 A.M., June 9, 1916.

T. F. WENTZ - - - -

CROSS EXAMINATION by Mr. Ray.

- Q Mr. Wentz, directing your attention a little more in detail to the soil conditions on Provo Bench. Provo bench is a river delta, is it not?
- A A lake delta.
- Q The sub-soils you have divided into three classes, the top soil you have divided into ~~three~~ three classes, have you not?
- A Yes.
- Q What is the subsoil of the Provo Bench?
- A It is porous coarse gray sand with gravel and sand up to two to three inches in diameter, and some boulders up as large -- I have seen some as large as two feet in diameter.
- Q The break between the upper soil and the sub-soil in the central part of Provo bench is very clear, is it not?
- A Yes.
- Q And after you pass through the upper soil, you pass into a layer of very coarse material?
- A Pass into the sand and gravel.

Q Now in that coarse material there is very little capilarity is there not?

A Very little.

Q So that the water passing through the upper soil is taken almost entirely by gravity to the bottom of the layer of coarse material?

A It is taken to the ground water plane which is 50 or 60 feet in depth. That porous soil only holds naturally about one and a half per cent of water, that is about $3/8$ of an inch in depth in each foot; at its saturation only holds 26/100 of a foot, and the amount that it will take up as capillary water on a 11 inch column with a bottom standing in water will only take up eight hundredths of a foot.

Q So that that class of soil, Mr. Wentz, underlaid with the formation that it is underlaid with is rather unusual as to the amount of water necessary to properly irrigate it?

A Well, it is not unusual, I don't understand exactly what you mean by unusual.

Q I merely use it comparatively as compared with soils underlying with clay, for instance where the clay sub stratum is close to the surface?

A Yes, you can only put -- with your clay you get some return water by capilarity and with this soil you can only store two inches in this two feet of soil. It will only hold two inches if you put five inches on you will lose three and the two remain there.

Q Now, have you ever made an actual soil survey of Provo bench?

A No.

Q You stated that the soil on top varied from one and a half to two feet in the middle section, or three feet?

A Yes.

Q That was just a general average, was it not, which you made, Mr. Wentz?

A Yes sir.

Q As a matter of fact, there are many tracts in which it is not a foot and a half, or some, at least?

A There may be some fields that are less than that. I think the general average is about two feet.

Q You have never made any survey, accurate survey of the acreage coming within the class through the middle of the Bench which you designate as requiring the lowest duty, have you?

A No.

Q Or that on the north where you have a clay loam requiring a less duty? A. No.

Q Or that on the south requiring a duty again less than the middle section?

A No, I have not, that would be almost impossible over this extremely porous soil; and the clay loams and clay types, it is ~~mainly~~ blending, it doesn't change on any definite line, but blends from one type to the other.

Q Now, Mr. Wentz, you were asked by Mr. Thomas, and I think by counsel for the plaintiff in respect to your table here, as to why you place a higher duty in the early part of the season. Calling your attention again to that, what is the effect of winter frost upon the porosity of the soil?

A The soil after the winter is loose and is uniformly moist and conducts the water from the surface, that is applied on the surface, very quickly to the sub soil in that condition. A soil that is dry, that is perfectly dry, won't conduct any water to the gravel below. For example, I had an experiment on a tract of land about three acres, sandy loam, water in furrowing, they were about twenty-five ~~rod~~ rods long. The water was turned in each furrow and it went down those furrows just like it would go down a timber flume. Soil was absolutely dry. Letting that water run for an hour, or possibly a little

longer than an hour, the water begin to percolate under the soil, after the soil was so it would conduct the water, and instead of the water going off the lower end of the tract it begin to go into the soil and gradually the water came back from the lower end, and after a time, wasn't more than half or two thirds the way down the tract.

Q Your conclusion from that is that moist soil is a better conductor of water to the porous substratum than dry soil is?

A A great deal better. In orchards where there are trees, say twenty feet apart, on only two furrows on each side of a tree, and the water is applied in those two furrows constantly every, ~~ix~~ say fourteen days apart, the land between the furrows and near the center of the strip becomes very dry, because the lateral motion of the water only extends about a foot from the furrow and the water is all applied underneath the furrows. It is moist. As soon as the water is applied in these furrows instead of going laterally.

Q Now, in addition to the frost bringing the soil into condition of porosity, plowing and cultivation have the same effect, do they not?

A No, plowing only for the amount that is cultivated, ~~ix~~ say one or two or four inches deep.

Q But to that extent it adds to it, does it not?

A Yes, it adds.

Q So that a high duty is placed upon your table early in the season for the purpose of ^{packing} ~~sitting~~ the soil and reducing the transmission loss?

A A low duty?

Q A low duty, I mean.

A Yes, and for the purpose of making the irrigation. It is impossible to make those irrigations with light applications in the early part of the season when the soil will conduct the

water rapidly to the sub-soil .

Q Now, what crops, if you know, are grown on Provo Bench in the main?

A On the porous soils in the center part of the bench alfalfa, orchards, grain and some garden truck. On the heavier soils, on the south end in addition to those crops, there are some beets grown. On the north end of the bench on the heavier type of soil there is in addition to those crops, quite a large area of beets.

Q Now, the middle soil there, middle section is not well adapted to grain as a crop, is it?

A Well, it is not adapted to anything particularly, excepting fruit, that is its main --

Q And it is largely devoted to fruit, is it not?

A Yes, I suppose as much as thirty per cent to fruit.

Q And fruit requires, as a matter of fact, a very large amount of water in the latter part of the irrigation season when the fruit is making, does it not, and ripening?

A In clean cultivation and at the time of the harvesting of the crop of fruit, peaches especially must be watered, those two irrigations near the first and tenth of September. Usually those orchards go the fourteen days, but those two applications must be made together.

Q And they must be relatively large applications, must they not, Mr. Wentz?

A No, not necessarily, the large applications don't leave any more water in the soil than the small applications. ^{Q.} That perhaps is a complete answer, but there must be an irrigation which completely saturates the soil there to the extent that is able to take up water?

A Yes, and they should cover the whole surface area instead of ~~9m~~ in furrows.

Q That keeps the fruit from dropping, does it not?

A Yes, and fills the fruit out.

Q With its joices. You stated you were familiar with the old Morse and Chidester decrees? A. Yes.

Q The quantity of water which you have indicated as a proper quantity of water for the Provo bench is a quantity in excess of that awarded under either of those decrees under a mean river, is it not? A Yes.

Q Do you know from any observation or investigation what percentage of grain the farmers on Provo bench have put in merely because of the scarcity of water under the Morse and Chidester decree?

A No, I could not say the percentage there, the quantity under those old decrees was so uncertain to the Provo bench.

Q And so inadequate, was it not? A. Yes.

Q So that, as a matter of fact, if that -- if the Provo Bench had that quantity of water to which it was entitled it might increase the area of its profitable crops and decrease the area of its less profitable crops?

MR. A. C. HATCH: Object to the question as assuming that the witness knows definitely and conclusively the quantity of water to which the Provo bench is entitled.

THE COURT: I think it is subject to that objection.

MR. RAY: I didn't want to become subject to that objection. I am merely having him assume a high hypothesis there without determining anything, if they had more water under any circumstances.

THE COURT: With that modification you may answer the question.

MR. RAY: That is the purpose.

THE WITNESS: Repeat the question.

Q I will reframe it in order to come within the objection. Assuming the Provo Bench irrigators should have a quantity of water in excess of the quantity which has been available to them under the Morse and Chidester decrees, might it not result in increas-

ing their area of profitable crops, fruit, vegetables and berries and decreasing the less profitable crops, such as grain?

A Yes.

Q Now, Mr. Wentz, turning to your report & I think it is -- no, report 2 page 5, you have made there, and there has been read into the record a table showing the duty of water under the so-called Morse decree, what acreages did you use in arriving at that duty?

A The acreages shown in the table and for this particular canal 4,333.

Q And that is true as to each canal indicated in the table that you use the acreage specified there which is the same acreage as that contained in your report of 1915, and used in the distribution of your waters for 1915?

A Practically the same on all the main systems. One or two of the minor ditches are changed.

Q What was the condition of Provo Bench as the fruit crop last last year?

A There was no fruit crop.

Q Because of what?

A Because of frost.

Q It takes a less quantity of water, does it not to mature -- to keep trees alive than it does to properly irrigate them for the maturing of a fruit crop?

A. Yes.

Q So that if in 1915 the fruit had not been destroyed by frost there would have been a greater quantity of water required for the fruit trees than that actually applied to them?

A Yes.

Q And you have taken that into consideration and stated it to the court upon your direct examination?

A Yes sir.

Q Now, taking the allowance which you have made under column 4 of this table to the Provo Bench; that in your opinion then

must give a greater quantity of water to the Provo Bench Irrigators than that turned to them in 1915?

A Yes.

Q And that because it is your desire to meet normal conditions, one reason, I mean normal crop conditions there?

A I don't like that word desire that you have in that question.

Q I mean that is the result of your purpose?

A The purpose is to deliver the necessary amount for those farms.

Q Now, when you fix your duty as you do there, as a matter of fact, you mean by a factor of safety a quantity of water which will properly irrigate those farms under a year of minimum precipitation, do you not?

A Yes.

Q And you have fixed your table to meet that condition?

A Yes.

Q Now, you say in column 2 of your table there, Mr. Wentz, that the duty is 63 up to the 20th day of July?

A Yes.

Q Upon each quarter section, as I understood your direct testimony you made your change of duty on that date, because in your opinion that was the last irrigation of grain, and the water which had been used ~~xxx~~ for the grain prior to that might then be devoted to the fruit and other crops to be matured?

A That is one of the main factors why the change was made.

Q Assume there were a materially less quantity of grain upon the Bench than that which you have figured, would you then extend the 63 acre duty beyond the 20th of July?

A Well, that is problematical, it is a diversified crop area and must be so on account of the soils.

Q Assume, Mr. Wentz, that instead of the last irrigation of grain being the 20th of July, it should appear that the farmers on Provo Bench because of the soil conditions, actually irrigated

up to the first day of August on their grain, would you then extend the 63 acre duty period to the first day of August?

A If that were uniformly so that they irrigated their grain over the whole area up to the first day of August, why that duty ought to be extended, but my experience is it does not go beyond July 20th.

Q Well, you have given your experience on that, but assume that you should conclude from further investigation they did irrigate up to July 20th quite uniformly up on their grain-- I mean up to August 1st, then in your opinion they should have the duty of water until the time when they ceased to irrigate their grain crops?

A Yes.

Q There is practically no seepage into the canal of the Provo Bench Canal Company, is there?

A No.

Q When do they first irrigate their grain?

A From the 20th day of May to the first of June.

Q Now, on the thinner soils along the bench, how often after the first irrigation has it been their custom, if you know, to again irrigate, how frequently do they irrigate?

A Their grain?

Q Their grain?

A Every two weeks.

Q And they irrigate some fruit in May and June, do they not, quite a good deal of it in some seasons?

A Yes, in June first irrigation on fruit, even in clean cultivation is in June, latter part of June.

Q Are there not some irrigations in May depending upon the crop?

A Yes, where it is lucern and clover between the trees, why they water as early as April the 20th.

Q And there are a great many orchards on the bench where that is

the condition, are there not?

A Yes.

Q And the licorn under those conditions or the clover, require for their proper maturing early watering?

A Yes.

Q The water coming from the reservoir up at the Union Reservoir system travels about sixty-six miles, does it not?

A Yes.

Q Goes over a great many water falls-- I don't mean large falls.

A It goes over some, I don't remember the number, there are falls about possibly fifteen or twenty feet in height.

Q And in that distance it drops down from ten thousand feet to about four thousand feet? A. Yes.

Q And has a very rapid and agitated current good part of the way, has it not?

A Yes, down to fifteen miles above Heber, very rapid descent.

Q And above those currents there is an almost constant mist of water, is there not?

A There is a constant evaporation there.

Q There is an apparent mist good part of the way, is there not, on warm days from the agitation of the water -- I don't mean heavy clouds of vapor?

A Yes, there is a mist there.

Q And that adds to the evaporation?

A Yes.

Q You have made no determinations to determine how long it takes a given quantity of water to move from one of these lakes to the mouth of Provo Canyon, have you?

A It moves from the lakes to the Wasatch dam in thirty-six hours and about one day from the Wasatch dam to the mouth of Provo Canyon.

Q So that it would be about sixty hours coming down?

A Yes.

Q And you have made no determination as to what the percentage of evaporation would be in that period?

A No.

Q Or what practical loss there might be by seepage?

A No.

Q Now, after you get into the canyon the river, while it may have loose river rock in it, moves through a practically impervious rock bed, does it not?

A The bottom of the river is practically impervious, and the communication between the river and the sub-surface water are entirely independent.

Q Do you know of any faults in the canyon which produce losses in water?

A No, the only place that I thought there would be losses in that river bed was between the Utah Power & Light dam and the head works of the Provo Reservoir Company. I made a measurement of that and found a substantial gain.

Q You might have a gain and a loss at the ^{same} time, might you not?

A Yes.

Q That is, you might gain through the inflow through the sub-surface and surface inflow 40 second feet and might be losing beneath the river 20 second feet and your total river would show a gain of 20?

A Yes.

Q But you have made no determination on that?

A No.

Q Have you ever made any determination as to the outflow of the reservoirs which you described yesterday and which are set forth more particularly in part 9 of your 1915 report. I don't mean the reservoir outflow, but the natural outflow during the entire season?

A No, we have not. We were under a rather misleading statement there on account of the facts that were determined before. These

went by.
River Bed
in Canyon
unfamiliar

7. 26.5

made no
determination
no -

Thought only
losses would be
between River
dam & ~~Basalt~~ ~~lets~~

Found a gain
there -

losses of the inflow, losses of the surface inflow into these lakes was counted as natural flow. Now, on the Washington Lake with it running a constant inflow of 75/100 of a second foot, it kept receding all the time and Trial Lake with its outlet valve closed and with the flow coming from Star Lake and down the ravines the lake continues to recede.

Q And those measurements, Mr. Wentz, were made, were they not, in the very latter part of the season?

A They were made in August.

Q Made in August when the subsurface inflow there might be very much less than it would have been during the earlier part of the irrigation season?

A Yes, it may be less.

Q Have you ever determined prior to the installation of the dams and such how much water actually went out through these lakes during the irrigation season and as a visible surface outflow went into the Provo River, personally determined that?

A No, I haven't that information.

Q That would be a quantity of water, if it were determined, which would find its way into the Provo River as it came down these different --

A Yes, if there was an outflow there in the latter part of the season it would naturally flow to Provo River.

Q That is entirely independent of your Weber River drainage? Now, wherever the river recedes to the 300 second foot river, for instance, at the mouth of Provo Canyon, are there then at least some tight dams in Provo Valley?

A Yes, and practically all the time.

Q There would not be a tight dam at 1500 second feet, would there?

A I understood you to say at the 300 second foot actual stage.

Q I know, but you said practically all the time, you mean practically all the time at that point and below ?

A At that point and below all the natural flow is stopped up

in the Wasatch Valley, when we get that low, and as ~~x~~ high as I stated yesterday, 422.

Q So that irrespective of that overflow, natural overflow of the Trial Lake and Union Lake system, if there were a tight dam at Midway that water during that period would not be available, would it, to the users in Utah County except as it came back by subterranean channels from the farms in Provo Valley?

A No, it would not be available to Utah County.

Q You have a made a colum 6 there, column 5, that includes two possible periods of irrigation, does it not, the late fall and early spring? A. Yes.

Q You recognize by that column that after the grain is off in Provo -- in the Utah Valley on Provo Bench, that they sometimes irrigate that ground, do you not, in the fall?

A Yes, they irrigate in the fall, and sometimes they irrigate it as late as November first. We were irrigating last year practically over the whole system on the first of November.

Q And that is beneficial irrigation, is it not?

A Yes.

Q And has been carried on for many, many years to your knowledge, by Provo Bench? A. Yes.

Q Your distribution of 1915, Mr. Wentz, was a distribution upon your idea of necessities, was it, that ~~is~~ to the extent that you had lattitude to give necessities?

A Yes, I can explain that fully and I tried it two or three times, but have not succeeded very well.

Q Let me limit the purpose of my question and then it may not require so much explanation, in view ~~x~~ of your former explanations. Section 16 of the decree of Judge Morse --

Section 15 provides: "That all the rights fixed, declared and decreed herein are founded upon appropriation of water necessary for some beneficial use, and that all such rights hereby fixed, declared and decreed are subject in their exercise to the con-

ditions that they are required and necessary for some beneficial use and that all such rights are expressly subject to the limitations and conditions that such waters are used for some beneficial purpose, and are used economically." Now, did you have that in mind in your operation as commissioner last year?

A Yes, this paragraph fixed the extent of the appropriation.

Q This particular paragraph?

A Yes.

Q Subject to the limitations which I have just read, did it not?

A Subject to limit of beneficial use.

Q And you had that in mind, did you?

A Yes.

Q Now, when you said yesterday that you ~~didn't~~ disregarded the Morse decree, you meant that you followed the stipulation under which you work to the extent that it modified the Morse decree and abrogate it, did you not, Mr. Wentz?

A Disregarded the tabulation in the Morse decree entirely.

Q The quantity was the quantity in the Morse decree, the distributees were the distributees of the Morse decree with the exception of the later appropriators, were they not?

A Yes.

Q And then the stipulation you understood to remand you to Section 15 of the decree as to necessary beneficial and economically uses?

A Yes.

MR. THOMAS: May I ask a question here, your honor. Referring to the last question propounded by Mr. Ray, Mr. Wentz, did you pay any attention at all to the ~~tabixix~~ tabulations as they were given in paragraph 5 of the Morse decree -- I have it right here?

A No.

MR. THOMAS: Did you assume that these tabulations

were based upon no established fact?

A I don't understand that.

MR. THOMAS: Let me say then, did you assume that the court in finding the result as set out in paragraph 5 of the court's decree that the court had no sufficient evidence to support that finding, that conclusion?

A Yes, I don't think there was sufficient evidence to support that .

MR. THOMAS: Then you think when the court rendered that decision as given in paragraph 5, that the court was wrong?

MR. RAY: I object to that as calling for a conclusion of the witness.

MR. THOMAS: He said he doesn't think there was sufficient facts to justify it, and trying very hard to establish that the decree was lived up to.

MR. RAY: Oh no.

MR. THOMAS: Then I misunderstood you.

THE COURT: The objection is sustained.

MR. THOMAS: Did you regard the findings and the tabulations as they were stated in paragraph 5 as wholly wrong?

A Yes

Q Did you regard them as having any validity so far as your operation was concerned?

MR. THURMAN: Object to that, calls for his conclusion as to a decree of the court.

THE COURT: What is the object of it, if there is any particular object in it --

MR. THOMAS: I am trying to find out upon what ground Mr. Wentz acted when he undertook to set aside a decree of established right.

THE COURT: That is apparent, but what is the object

of it. How can it assist you any?

MR. THOMAS: I think it would assist us in establishing some bias, at least, in some of the actions of Mr. Wentz.

THE COURT: Objection is sustained.

MR. THOMAS: Note an exception.

THE WITNESS: If you will permit me I can clear that point up.

MR. JACOB EVANS: That is exactly what I was going to suggest to the court. I think the stipulations clearly fix that, and if Mr. Wentz is permitted to explain that I think it will be clear to everybody's mind why he made the distribution under the stipulation and not according to the decree of the court.

MR. RAY: I don't think that is material at all. Mr. Wentz has once described it and it seems a waste of time.

THE COURT: It seems so to me. Here is a stipulation and here are two decrees, and operating under the two decrees and stipulation Mr. Wentz has made his assumed best division of this water pending the trial of this case that he could; whether he was accurate in all that he did or whether he made mistakes is not material to us now. It won't in any way aid the court in determining the rights of the several parties. I don't think it is material matter at all. While it would be interesting as suggested.

MR. THOMAS: The court has already ruled.

MR. JACOB EVANS: I don't want to prolong this matter at all, but just a very short statement -- no, I guess I will make no statement at all. I was going to say that was our understanding, all of us, at that time, ~~hm~~ that the water was going to be distributed exactly as Mr. Wentz distributed under the decree -- that is under the stipulation, that was the express understanding of the stipulation.

MR. THOMAS: To reply to that would be only to indulge

in argument.

THE COURT: Any further questions?

MR. THOMAS: Not from us.

MR. BAGLEY: I would like to examine the witness briefly.

CROSS EXAMINATION by Mr. Bagley.

Q Mr. Wentz, does the ground water have any effect upon the quantity of water that is required to irrigate a tract of land?

A That depends entirely upon the soil. If the soil is a clay and uniform or if it is sand and uniform and is not cut by stratas of gravel or sand the soil will conduct by capilarity from the ground water plane to the surface. If this soil is outby stratas of coarse sand or gravel there won't be any water coming from the ground water plane to the surface soil. A very plain illustration of that. I noticed last summer on Spring Creek immediately west of provo there was some grass one foot above the ground water plane that was dying for want of water. The soil was very shallow, about six to eight inches and below that that the ground water plane was in was small river rocks and gravel, and there was no way that this water could get to the soil even in so short a distance. In the deeper soils and uniform soils why it is available for the plants at the surface.

Q What is the character of the soil in the First Ward Pasture, that is the sub-soil, is it underlaid with a strata of gravel?

A In some places that I have noticed there, the only observations I have had where the ditches are out, and the Factory Race.

Q Is that a coarse gravel or fine gravel?

A It is relatively coarse.

Q Do you think that the First Ward Pasture soil construction is

such that no benefit accrues through ground water?

A Some parts of it, yes, and the lower part, why, it is amply
Q supplied from below.

Q Do you know about what the yth depth from the surface to the
ground water is in the First Ward pasture?

A Well, it varies from the upper end, it is down about ten feet;
down towards the lower end it is right at the surface.

Q So you think there is that much difference between the lower
part and the upper part of the pasture, ten feet?

A Yes, the Factory Race -- no, there isn't that much difference.
I was thinking of the Factory Race in the out north of the
road, the Factory Race is about four feet below the surface.

Q Have you made any investigation to determine that fact?

Q No.

Q Do you know of any having been made?

A No.

Q Have you ever seen the water, the result of the investigation
of ground water made by the government in this section?

A Yes.

Q And have you noticed that plat?

A Yes.

Q Of the ground water?

A That is not always the same, that is the trouble, it changes.
Ground water is not the same. Take for instance under the
city here, the ground water plane is a great deal lower now
than it is later in the season.

Q Well, don't the lake in this valley have some effect upon
the ground water conditions in sections immediately surround-
ing the lake?

A Oh, immediately adjoining the lake, then a few hundred feet it
has a light effect, farther back has no effect whatever. The
ground water plane slopes practically the same slope as the

the surface, even on hilly country the ground water plane follows the contour of the surface.

Q Yes, but in the First Ward Pasture section the ground water plane is almost horizontal, isn't it?

A I don't know, it would be nearly horizontal because the pasture is nearly horizontal. There is probably just the same drop in that ground water plane as there is in the surface.

Q Well, if ground water planes are continually shifting, is it your conclusions that surveys for the purpose of determining ground water conditions are useless because of the shifting conditions?

A No, they are a source of information that they give for that particular season of the year. The shifting is from one part of the season to the other.

Q But it is not of much importance in a generally way, is it?

A No, except --

Q Slight variation during the season?

A It is not of any importance in the way that you speak in this Valley, but does become important in the Wasatch County.

Q If, as a matter of fact, the ground water in the First Ward Pasture was only three to nothing from the surface, three feet to nothing from the surface, and the ground water on the Provo Bench and on the East Bench in the section where the Timpanogos Canal Company is from twenty to thirty feet under the surface, would that make any difference in the quantity of water which would be required to irrigate the land?

A Where the gravel strata is above this ground water plane in the First Ward Pasture between that and the surface it would not make any difference. If the ground water plane was only two inches below it, or whether it was two thousand feet below it wouldn't make any difference at all.

Q Well, you didn't make any answer, you ^{mean} ~~xxx~~ to say then it would not make any difference at all whether it was three feet or a

thousand feet?

A Not if there is a strata of sand and gravel that won't conduct the water to the surface.

Q Now, you have undertaken to classify this soil, what do you say with respect to the conditions regarding which I have asked you, do you say that there is this strata of gravel which makes it of no consequence, or is the strata of gravel absent so that it is of consequence?

A In some parts of the First Ward Pasture the gravel can be seen, other parts it is not, and I don't know the areas of those different parts.

Q How do you determine this coefficient, that is the relative coefficient if you don't have this acquaintance with the soil conditions?

A I don't have it in detail. I determined the coefficient by the knowledge I have of all the system, and only to that extent.

Q If you don't know enough about the soil to know whether the ground water has any effect upon the amount of water required for irrigation, how can you determine the relative value of these coefficients?

A I have determined them just as I stated from the knowledge that I have and observations.

Q Then you acknowledge, however, your knowledge upon which these are based is not complete, but only -- I ~~will~~ won't call it smattering because it is probably beyond that, but it is far from being complete.

A Yes, I have no detail surveys of the areas.

Q And it is a general survey by observation rather than by any local tests or measurements or anything of that kind?

A Just different observations I have been able to make.

Q You might be mistaken in these areas?

A How is that?

Q You might have drawn wrong conclusions because of the brief-
ness or limited character of your investigations?

A Yes, they may be slightly in error. They are only to the
extent of the knowledge I have.

Q You might err five or ten per cent?

MR. A. C. HATCH: I ask the witness be allowed to
complete his answer.

MR. BAGLEY: Probably I am applying them too rapid-
ly, I don't intend to.

MR. A. C. HATCH: He was interrupted by counsel.

THE COURT: Yes, you may ask the next question.

I take it the answer is now interrupted so that he wouldn't add
to it.

A No, I don't think I could be in error that much, I could not
say I am in error at all, when I have ^{given} you the coefficients to
the best of my knowledge.

Q And you are willing to acknowledge that your knowledge is very
incomplete in respect to these details?

A I have no knowledge of the detail surveys over the different
areas of the tract.

Q If upon an actual survey and measurement and investigation
such as you would consider to be complete, the results were
different then you would acknowledge yourself in error, wouldn't
you?

A Certainly.

RE-CROSS EXAMINATION by Mr. John E. Booth.

Q Mr. Wentz, did you get the information I suggested to you
yesterday? A. Yes.

Q Be glad if you would give us that at this point?

A Using the areas --

MR. JACOB EVANS: What report are you using? Mr. Wentz?

A Given on page 9 of part 8 of the 1915 report, and assuming that

the population of Provo City is ten thousand people, the amount of water to the water works would be 5.35 second feet.

MR. RAY: I understood that the total was what was being asked for, we don't care which it is.

MR. JACOB*EVANS: He can give the detail if he has it.

MR. JOHN E. BOOTH: What I ask for was total. If he has details I have no objection, of course.

A I would have to give you this information in order to give you the total and you may have the acreage as the total if you desire. Do you ~~xx~~ desire it all in detail?

Q I am not particular for it, perhaps some of the others would prefer it.

A And assuming there are six hundred acres irrigated in the Provo City lots or one half of the acre, be 12 second feet. Timpanogos Canal Company 14.12 second feet.

MR. RAY: That is in column 1?

MR. BAGLEY: That is the total of acre feet under this schedule.

THE WITNESS: That is second feet.

MR. RAY: Perhaps your honor, I have not gotten this and want to get it to make up the schedule as I go. That is for what period?

A That is for the first column to June 20th.

Provo Bench 76.02 second feet;

West Union, Smith and Carter Ditches 33.33 second feet;

East River Bottoms Water Company 9.61 second feet;

Barton and Young Ditch 1.08 second feet;

Park and Nuttall Ditch 2 second feet;

Upper east Union 13.37 second feet;

Faucett Field 2.1 second feet;

Provo City acreage 43.05 second feet;

Young, Dixon and Baum Ditch combined 2.1 second feet;

Little Dry Creek 8.43 second feet;

Lake Bottoms 15.9 second feet;

Port Field 7.18 second feet;

Spring Creek Users 5.52 second feet;

First Ward Pasture from the Factory Race 2.5 second feet;

Total 253.66 second feet delivered at the limits of each quarter section of land, and without any allowance made

for losses in transmission.

Q What was that total?

A 253.66.

MR. RAY: That is the net duty at the land or net total to supply the duty at the land.

A At the limits of each quarter section.

MR. BAGLEY: Don't include any water for the plaintiff?

A No.

MR. THOMAS: You have given all these ditches that you have on the plat?

A Yes.

Q Now, Mr. Wentz. one other question. Do you desire all these figures should come for every one of these columns?

A I have not figured only the first column, that is all you asked for.

Q That is all I was particular about, to get now the idea, I wanted from this, I am not particular at all about going into the other. There is another question, however, I wanted to ask. Taking those small figures to the right and little above as if they were exponents, take any one of them, 1.53, is that on the West Union Canal?

A 1.43.

Q That is one foot and $\frac{43}{100}$ acre feet?

A For each acre of land.

Q For the entire season?

A No.

- Q What is what I want to get, that is the amount for that period?
- A Yes.
- Q That is satisfactory then, that is all.

CROSS EXAMINATION by Mr. Wahlquist.

- Q Mr. Wentz, can you say during what period of the year the reservoirs at the head of the canyon are filled?
- A Last year the gates were closed on the first of April. This year the gates were closed on the -- Wall Lake on the 7th day of April, the Washington Lake gates were closed last fall late in the fall. The Trial Lake gates are not closed now.
- Q Is it to be presumed that the Trial Lake gates will be closed at all this season?
- A We expect to close the Trial Lake gates in about two weeks. The Trial Lake fills up very quickly and usually has a large supply, that is the only reason it is not closed at this time.
- Q That would be about June 24th that you would close that, or June 20th, we will say?
- A Well, it may be earlier than that.
- Q And about what time is the water in the lakes, reservoirs, released for irrigation?
- A In 1914 it was released on the 17th day of July, and in 1915 it was released on the 4th day of July.
- Q Now, if, as you believe, the sub surface drainage or underflow of those lakes is towards the Weber, are you not increasing that underflow when you raise the water level up as much as twenty-five feet above the normal level of the lakes?
- A Possibly, yes.
- Q Isn't it almost certain wouldn't the weight of twenty-five feet of water increased pressure tend to increase the underflow?
- A Well rather than the weight it would be the number of seams through the rock that would discharge that extra amount of water.

Q That is, by raising the water there may be other crevices that would carry water?

A Those bedding planes there are only two or four feet in thickness. You get another seam on an average about every three feet

Q The Washington Lake you stated normal size was fifty acres, and when it raised to a level twenty-five feet above the surface was approximately one hundred twenty five acres, or nearly 150 per cent larger surface when the lake is at 25 foot level wouldn't evaporation be increased in proportion?

A Yes, directly.

Q Now then, Mr. Wentz, as I understood you to answer the other counsel, so long as there is any natural flow from any of those reservoirs, it was towards the Provo River?

A Yes.

Q Then isn't all this increase lost by percolation towards the Weber and by ~~exp~~ evaporation taken from water which except for the existence of the reservoirs would be going down the river and available for use as high water above the Wasatch Canal ~~then~~ dam during the entire period up until the time the reservoir waters are released?

A That amount that is lost by evaporation and seepage on the extra surface and the extra height of water, storage water, during the flood water season is water that would go through the river and into the Utah Lake. Our flow in Wasatch County during our high water is a great deal more than the capacity of the canals.

Q It would be going down the river up until such time as the time that it is released from the reservoirs, wouldn't it, that is, prior to that time during May or June of the year, it would be going down the river if not in the reservoirs?

A Yes.

Q And if needed for irrigation above the Wasatch Dam it would be available for use for irrigation when it was going down the

river, would it not?

A Yes,

Q Now, with regard to porosity, you say that the frost increases that, that would be true that the frost will increase the porosity of the soil just as far down as the frost extends during the winter?

A No. I will say yes to that first. Porosity is not as big a factor as a uniformly moist soil. The moisture of the soil is a greater factor in conducting that water from the surface to the sub-surface than the looseness of the soil.

Q Now, however, just as deep as the frost extends in the soil it disturbs the condition and tends to increase the porosity in the early spring, does it not?

A Yes.

MR. CORFMAN: May it please the court, like to ask a few questions in connection with the rights of the First Ward pasture.

RE-CROSS EXAMINATION by Mr. Corfman

Q You are familiar with the lands of the First Ward Pasture?

A Yes sir.

Q And what kind of crops are grown on these lands?

A It is pasture lands entirely.

Q And is it not true that frequent applications and larger quantities of water are necessary to successfully grow the grasses there than on lands generally throughout the Provo River system?

A Pasture land requires more water. This land requires more. Any pasture land than it would if it was uncultivated land, that is tillable, but the land in the First Ward Pasture is a better class of soil than the average soils on the Provo River system and holds a greater amount of water and holds it better than the average soils.

Q These lands are used exclusively for pasture, are they not?

A Yes sir.

Q And it requires more frequent application of water and greater quantity in order to make a good growth of grass?

A It requires frequent applications and greater quantity to grow grasses on that land than it would cultivated crops.

Q During the season of 1915, is it not a fact that the water applied to the lands in the First Ward Pasture was taken largely from the Mill Race after the water had been used for power purposes?

A They can take the water for the First Ward Pasture after it has been used by all the power rights except the Smoot Lumber Company.

Q And they do that in practice?

A Except the Smoot Lumber Company water that goes through the Smoot Lumber Company mill is not available for the First Ward pasture for irrigation. The tail race is below the ground .

Q And during the season of 1915 they did take the water from the Mill race after it passed through the wheels of the manufactures?

A Yes, that is done I think every year.

Q And there wasn't any limitation as to the quantity they took made by yourself on account of the water being there and not utilized elsewhere?

A No, no limit at all on it.

Q They used the water as they found it?

A Yes.

Q Without any limitation on your part?

A Yes sir.

Q And that has been the practice as long as you have known that pasture?

A Yes sir.

Q Isn't it a fact that the grasses almost to the water edge, class of grasses that are grown there would die out if they were not irrigated?

A Yes, there is some area of that that needs irrigation all the time.

Q I wanted to ask you further Mr. Wentz, in regard to the circular notes that you mentioned that you sent out before you proceeded in 1915 to distribute the water as you testified that you did distribute it; to whom did you send your notice, to what officer of the First Ward Pasture Company?

A There was no notice sent to the First Ward Pasture.

Q Was there any notice sent to the defendant, the Provo Woolen Mill?

A. No.

Q Was there any notice sent to the defendant, the J. Ward & Sons?

A No, those interests are outside of the notice. The notice was asking only for areas.

Q It was not meant for any mill owners?

A No.

Q Was it sent to the Upper East Union Irrigation Company?

A Yes, I addressed to the Upper East Union Company.

Q To the company or some of the officers?

A Upper East Union Irrigation Company.

Q Was it sent to the Little Dry Creek Irrigation Company?

A Yes, it was sent to all the companies that are addressed in the letter.

Q And you addressed them to the companies and not to any particular officer?

A I addressed them to the company and sent them to the secretary of the company or the president. I think in one or two cases they were sent to the president of the company.

MR. COREMAN: Now, may it please the court with permission of counsel, I would like the privilege of recalling Mr. Wentz for further cross examination in behalf of the Utah

Power & Light Company after consultation with the associate counsel.

THE COURT: Very well, any redirect at this time?

MR. JACOB EVANS: Just a question.

RE-DIRECT EXAMINATION by Mr. Jacob Evans.

Q The water that is used by the machine interests and the first Ward Pasture Company and the other parties mentioned by Mr. Corfman is all distributed by Provo City, is it not?

A Yes, the changes are made by the city.

Q You merely distribute the water for those parties to Provo City and Provo City attends to the distribution of that water among these other parties?

A Yes.

Q And is that the reason why you did not send them notices concerning it?

A No, this letter that he speaks of was asking for irrigated areas. Letter was sent to the city and mill interests have no irrigated areas.

Q You said, Mr. Wentz, that the first Ward pasture could use the water that was used by the mill interests except the water used by the Smoot Lumber Company, that its mill race was below the First Ward pasture?

A Yes.

Q Doesn't the tailrace of the Smoot Lumber Company come out just below the old Rio Grande depot?

A Yes.

Q How far is that from the First Ward pasture?

A It goes through the northwest corner of the First Ward Pasture, joins the Factory Race at the northwest corner of the pasture and is about four feet, I think, below the irrigation distributing system of the First Ward pasture, four feet lower in elevation.

- Q Would there be anything to prevent the putting in of a dam there raising the water up and taking it out?
- A Yes, the water from the Smoot Lumber Company wheels has no fall until it enters the First Ward pasture corner, near the First Ward Pasture corner. A dam in there would back up on the Smoot Lumber Company wheel.
- Q How far would it have to flow before it could be taken out in the pasture?
- A Well, I couldn't say, I haven't the grade of that country.
- Q You don't mean to say, do you now, definitely, that none of that water could be used if a dam were put in to raise the water up so that it ^{could} be taken out and used on some portions of that pasture.
- A Maybe towards the lower end some of it could be watered from tail race.
- Q What is the water used for after it leaves the mill race, after it leaves the Smoot Lumber Company?
- A It is not used, it goes to Utah Lake.
- Q What quantity does it amount to about that goes through the ^{of} wheels ~~the~~ the Smoot Lumber Company, if you know.
- A I don't know what they use through that wheel.
- Q Mr. Wentz, you were asked concerning the east drain, does that flow through the First Ward pasture?
- A Yes, that irrigates part of the First Ward Pasture.
- Q Was that counted as any part of your distribution of the water of Provo River? A. No.
- Q Do you know about how much water there is in the East Drain?
- A No.

MR. THOMAS: He stated yesterday he didn't know anything about that, I asked him especially about that.

- Q Now, you were asked concerning your knowledge about the sub-soil in Provo City. You said, if I remember correctly, you had but little technical knowledge, but have a general

knowledge, I will ask you Mr. Wentz, if you saw the drains that were opened ~~i~~ here in Provo City or the sewer at the time they were laying the sewer pipe?

A Yes, I saw the trench for water works and drain, holes for the telephone poles, ^{saw} ~~there was~~ a great number of them, saw the trench that was made last year for the sub line of the telephone down Center Street.

Q And what did those excavations consist of in so far as they applied to the sewer, what was the extent of them that you saw?

A So far as applied to the soil?

Q What was the extent of the excavation, how many streets did it cover?

A Well, I seen it on a number of streets.

Q Covered practically the entire city, didn't it?

A I guess I seen practically all the soils in Provo at different times by trenches.

Q What depth have you seen them?

A About four feet, some of them as deep as nine feet. The sewer went as deep as nine feet.

Q Did you notice whether in some of these sewer openings whether or not there was streams of water running in them?

A Yes, the ground water in a great deal of the ~~xxxx~~ sewer work in the southern part of town was above the lower line of the sewer grade line.

Q What would you say of these telephone post holes or sewer trenches and the other excavations that you have spoken of did they contribute to your information as to the character of the soils in the community of Provo City?

A Yes.

Q And in the ~~city xxxxi~~ city itself? A. Yes.

Q Do you know whether the cemetery is irrigated from the water works system?

A By the sprinkling system, the water works system.

Q I take it, Mr. Wentz, you have seen graves dug in the cemetery and know the character of the soil in that vicinity, do you?

A Yes.

Q Mr. Ray asked you concerning the use of the water with respect to people planting more wheat and grain crops which were less profitable than fruit crops on account of the lack of water, as I understood it; now, when did you have your last fruit crop on the Bench, Mr. Wentz, full crop of fruit?

A 1913.

Q What was the result of the marketing of that crop?

MR. RAY: I object to that as irrelevant and immaterial.

THE COURT: Do you claim anything for your examination, profitability of the crop?

MR. RAY: I know, if your honor please it was not objected to and the rule might ordinarily be they would be permitted to go into it, but the purpose of that examination was not the litigation and determination by this court of what crop a farmer might desire, should plant, but as to the relative necessities and what he might be permitted to plant. We cannot litigate here the relative profits. That was merely a method of characterizing crops, not a method of determining profit.

THE COURT: You assumed at the time one crop was more profitable than the other and based your examination on that. The court wondered at the time whether there was anything to base the assumption on, the court did not take notice of the fact, had no knowledge of the fact. In fact, my opinion seemed to be contrary to that view, and if you don't claim anything for your assumption that the wheat crop is more profitable --

MR. RAY: May or may not be, I don't know, and nobody could determine the fact as to that, your honor, and this would

not determine the fact.

THE COURT: You claim nothing for your assumption then?

MR. RAY: No.

THE COURT: Then you need not examine on that.

Q You may state, Mr. Wentz, whether or not it requires any more water to irrigate fruit lands, such as peaches, apples, pears and tree crops, than would be required to irrigate wheat crops acre for acre?

A During the latter season it would require more for the fruit crops, especially where they have a cover crop such as lucern or clover.

Q Suppose they have no cover crop?

A Clean cultivation?

Q Yes.

A Well, there wouldn't be a very great difference between the two crops, the wheat crop would be earlier irrigation, land applied earlier and fruit crop --

Q Be a later?

A Be a later.

Q During the same period of time, Mr. Wentz, where the trees, where the land is cultivated between the trees, you may state whether or not it wouldn't take less water to irrigate those trees than it would to irrigate a wheat crop where the land is entirely covered with a grain crop?

A During the first period up to the ending of the wheat crop, why, the wheat crop would require a great deal more than the orchard, but the fruit crop greatest requirements is from September 1st to September 10th.

Q I understand, but now if the land was cultivated between the trees wouldn't you run the ditch along on either side of the trees wouldn't you run the ditch along on either side of the tree without flooding the whole area of land and get all the benefit that would be necessary for the production of the

fruit crop?

A Not on the porous soils, where those porous soils are water in furrows, it is just -- those furrows just as good a conductor as a pipe line would be to the sub-surface. You have to flood those areas on those porous soils, make a light flooding over the areas. Over the deep and uniform soils a few furrows is a great deal better, cut down your evaporation losses and practically store all your water in the soil.

Q Now, this table which you have placed upon the blackboard and get the totals which you have given to Judge Booth, you say gives a greater quantity of water than was actually distributed by you to the various canal companies during the year 1915?

MR. RAY: I object to that assumption, your honor please. That is not the testimony of the witness, the testimony of the witness it gives a greater quantity to the Provo Bench than it did during the year 1915.

MR. JACOB EVANS: Then we will confine it to the Provo Bench.

THE WITNESS: Read the question, please.

(Question read)

A The losses in that system are -- distributing system are approximately ten per cent, and the difference in the quantity last year and the difference shown by the table is but a comparison of the two tables.

Q Now, as a matter of fact, in making your totals for the table which you have placed upon the blackboard, you had to assume what the loss in transit would be if you not, Mr. Wentz, from the intake of the canals to the quarter sections?

A No.

Q How did you determine?

A Doesn't make any difference what the transmission losses are, whether 50 per cent, 75 per cent or 100 per cent or whether the inflow is one and a half, two or three times the amount, doesn't

affect the table.

Q I understand it doesn't affect this table, I don't think you understand me, you have given certain totals here of the water, first column No. 1 would show making a total of 253.66 second feet all told.

A Yes, that is at the -- delivered at the limits of each quarter section of the land.

Q But the fact that you get a total of 253.66 second feet delivered at the land would have no application or no bearing upon your actual distribution of water in 1895, would it?

A No.

Q None at all? A. No.

Q Now, in 1915, you ~~was~~ made an actual distribution?

A Yes.

Q As shown by the tables?

A As shown by the table in part 8, page 16.

Q And the distribution that you made was measured at the various measuring devices of the various companies as they are now constructed? A. Yes.

Q Which is a short distance from the intake of the head of most of the canals?

A No, on the Provo Bench system it is a mile and a half or more away. Provo City system the intake is at the mouth of the canyon, and the rating stations are just north of the city, five miles away. The Upper East Union, it is probably two and a half or three miles away.

Q And as I remember your testimony you stated that the actual distribution which you made in 1915 measured at those various places was sufficient to produce the crops under these various canals?

A No, there was -- those canals that had the transmission loss such as the Provo Bench and Timpanogog were a little deficient, but I think, as I say, with the transmission losses made up would

make that deficiency. Of course their fruit crop was off last year. Take a normal year when their fruit crop was on in order to supply sufficient water to those people to properly irrigate their lands, this deficiency should be made up to them and water delivered at their farms.

Q Yes, but you stated, did you not, on your direct examination, what that you distributed in 1915 was sufficient for the production of the crops?

A Of that year.

Q Of that year, yes.

A That is an abnormal year, though.

Q You say it was an abnormal year with respect to the crops, because there were no crops of fruit on Provo Bench?

A Yes, over the whole district there was no crops of fruit.

Q Isn't that true this year?

A Yes.

Q Hasn't it been true number of years past?

A True this year, last year. There was a good crop in 1913 and number of years previous. It is an unusual thing to freeze.

Q It ~~is~~ has been the usual thing for the past two years, hasn't it?

A No --

Q Particularly in 1914, '15 and '16?

A It has been the case in those three years, but it is an unusual condition.

Q You stated to Mr. Ray that in the preparation of this table, that you allowed a little surplus for an extraordinarily dry year where there was no precipitation, as I remember it?

A Well, I made have conveyed that idea, but this table will take care of the bad years, and whatever the ^{conditions} ~~partitions~~ are for the change in season, little wetter or little dryer, we cannot provide for those condition.

Q In 1915 there was no rain at all, I understand it?

A¹ No, we went eightyseven days without rain.

Q And it was during the irrigation season ?

A Yes.

Q Now, with respect to the waters of the reservoir being turned out of the reservoir and going over waterfalls and mists of the water being lost by reason of that, I take it the natural waters of the river run over the same waterfalls, do they not?

A Yes.

Q And those mists occur whether the Provo Reservoir water is turned into the river or not, don't they?

A Yes, the mists occur with ~~most~~ both kinds of water.

Q And evaporation occurs with both kinds of water?

A Yes sir.

Q And the losses occur with both kinds of water?

A Yes.

Q Running down the same natural channel?

A Yes.

MR. RAY: We don't contend the Provo Reservoir water is peculiarly wild, anything of that sort.

MR. THURMAN: May I ask one question. Mr. Wentz, in 1915, if I get the total right, you distributed 288.4 to the system, that is, to the defendant?

A The defendants in the Utah Valley.

MR. THURMAN: That is right, is it?

A Yes sir.

MR. THURMAN: And your table worked out as you worked it this morning made 253.66 cubic feet necessary at the limit of the quarter section?

A The amount of 288 was the gross duty taken at the measuring stations of the canals. The amount 253.66 is delivered at the limits of each quarter section of land.

MR. THURMAN: The difference between the two is the loss in transmission, is that the idea?

A No, I don't know what the loss in transmission is. The 288.4 was designated by the stipulation as the amount to be measured to the companies, the defendant companies in the Utah Valley. It has no significance whatever to the 253.66.

MR. THURMAN: Well, did you assume -- is there any assumption that that would be the amount of the losses from the measuring points down to the limits of Provo City, the difference between these two figures?

A No, no bearing at all.

Q In making up your total of that as shown by column 1 of the table, did you, or did you not take into consideration the machine interests along the Factory Race?

A I didn't take that into consideration.

Q That would add then to the total of 253.66 to this table 19.30 second feet?

A Yes, that 19.30 is only an assumed amount.

Q Yes, I understand.

A That may be more or may be less, I don't know, it is only an assumption.

Q And you have reduced the municipal rights from 24 second feet to 5.35 second feet in this table?

A Reduced it to 17.35.

MR. RAY: What was the Provo City lots, if I may get it?

A I assumed 600 acres.

MR. RAY: What was the second feet there, I didn't get that, twelve something.

A Twelve.

MR. THURMAN: I would like to ask the witness in another form the same question, your honor please. I either don't understand these numbers or the witness misunderstood me.

DIRECT EXAMINATION by Mr. Thurman.

Q Going back again Mr. Wentz in 1915 you distributed 288.4 to the defendants in Utah Valley?

A Yes.

Q Under a stipulation. Now, you say that with the exception of some deficiencies to the Provo Bench and Timpanogos, that was enough in your judgment? A. Yes.

Q Is that right? A. Yes sir.

Q Now you say --

A A deficiency to the Upper East Union. They were deficient and I think there would be some possibly heavy losses in that canal on account of its long run.

Q Very well those three canals you say there is a deficiency. Now, in your calculation this morning you find as necessary delivered at the limits of the quarter section 253.66?

A Yes the 253.66 does not include the Factory Race, that is not included in the 253.66.

Q Then, do I understand that by adding the Factory Race you would make up practically the --

A Add the Factory race to the 253.66 and you get the total of column 1.

THE COURT: 272.96 would be the amount?

A Yes.

Q 272.96? A. Yes.

Q Very well, then we will take 272.96 and take the difference between that and 288.4, the amount you actually distributed, and I will ask if the difference is not intended, or does not account for the loss in transmission between the points where you measured last year and points where you say it should be measured?

A No, there is no relation between the two. Those losses in addition to the 272.96 evidently would make it up to the 288.4.

Q That is what I say what losses do you have in mind?

A Losses in transmission.

Q That is exactly the point.

MR. JACOB EVANS: Lost 17.30 and five second feet out of the Provo pipe line too, didn't you? You figured the Provo municipal rights as 24 when you distributed?

A Yes.

MR. JACOB EVANS: And reduced that in this table to 5.37?

A Reduced it to 17.35. The 24 second feet includes the water works system.

Q In any event there must be, whether you so intended it or not, the difference between what you distributed last year at the head gates or measuring points, and what you say is necessary now delivered at the quarter section should account for some loss in transmission? A. Yes.

RE-CROSS EXAMINATION by Mr. Thomas.

Q You made a statement, at least I understood you to say that the water after it left the ~~partix~~ or passed the Smoot mill, passed down through the race, passed directly into the lake?

A Yes.

Q Did you mean by that that no further use was made of it?

A Yes.

Q Isn't it true that water mingled with other waters, it helps to flush the sewerage of Provo City?

A No, the sewer line --

Q Or carry sewerage rather?

A Yes, the sewer discharges into the Factory Race near the northwest corner of the pasture.

RE-CROSS EXAMINATION by Mr. John E. Booth.

Q Mr. Wentz, is there not quite a number of city lots and quite a

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Q Or carry sewerage rather?

A Yes, the sewer discharges into the Factory Race near the northwest corner of the pasture.

RE-CROSS EXAMINATION by Mr. John E. Booth.

Q Mr. Wentz, is there not quite a number of city lots and quite a

number of acres of land that are watered from the waters of the Factory Race after it runs through the factory, southwest part of the city, is there any lots, and south field?

A Some of the area is watered from the Factory Race, but there can be no land watered from the Factory Race after it leaves the Smoot Lumber Company.

Q No, but between the Smoot Lumber Company and factory itself, woollen mills.

A Yes, there is some diversion.

Q You take that into consideration at all when making your calculation this morning?

A No, there is no relation there, where the water comes from doesn't make any difference, whether it comes out of the Factory Race or whether you carry it over there in a bucket.

Q Then did you make any calculations of using it double in your 258 feet last year?

A No, I didn't make any calculations on that.

Q So that the fact would be that the city last year received their amount at their head gates and then used including the factory water, and then used it again, didn't they, and for these lots in the southeast part of southwest part and south field?

MR. THOMAS: Object to that as improper re-direct, and assuming facts not presents/d to the court.

MR. JOHN E. BOOTH: It just happens I am not asking any direct question, had none in the beginning.

THE COURT: Objection overruled on the ground it is not proper redirect. This is cross examination.

MR. THOMAS: I withdraw the objection.

Q Isn't it a fact, Mr. Wentz?

A Read the question.

(Question read)

A The amount of water as shown by the report was delivered to

Provo City and the Factory Race at their stations near the Brick yard north of the town. They made their distribution themselves, taking their amount through the East Union, Tanner Race, City Creek, and diversions from the Factory Race were also made by themselves.

Q Well, the conditions would be better for the city than if they didn't exist, would they not?

THE COURT: I don't understand the question so I wouldn't understand the answer.

MR. JOHN E. BOOTH: If the city gets a certain amount of water for their rights including the Factory Race, Factory Race separate from the irrigation, now then use that Factory Race water for irrigation and get their amounts according to the lands, the same as other people, then they have an advantage.

THE COURT: I see.

MR. JOHN E. BOOTH: That is as I see it, at least. Of course, I don't pretend to see everything as everybody does, but I just happened to see it that way.

Q Now, am I correct in my conclusion?

MR. RAY: I object to that as calling for a conclusion of the witness upon a matter which the court will conclude whether they have an advantage. The question answers itself.

MR. JOHN E. BOOTH: I withdraw the question as the court answered it.

RE-CROSS EXAMINATION by Mr. Ray:

Q Mr. Wentz, you have made actual determination of loss in transit upon the distributing system of the provo bench, haven't you, in the past?

A Yes sir.

Q And you have taken into consideration those losses in fixing the duty which you have put upon your table upon the board.

haven't you, that is, that experience?

A Yes.

RE-CROSS EXAMINATION by Mr. Coffman.

Q Mr. Wentz, the 24 feet that you designate as a municipal right during the season of 1915, did you consider that amount as being continuous in the water works system in the city?

A No, there was 8 second feet in the water works and 16 for irrigation of lots. Part of the time there was only five second feet in the water works. Five, I think was the minimum and 8 about the maximum.

MR. RAY: I take it as commission of the court anyone may recall Mr. Wentz for his own purpose.

THE COURT: Any time.

IRWIN JACOB recalled.

DIRECT EXAMINATION by Mr. A. C. Hatch.

Q Mr. Jacobs, have you obtained the data that I asked you for yesterday, with regard to the capacity of the several reservoirs at the head of the river?

A Yes.

Q And the number of acres of land irrigated under the Provo Reservoir system, have you the capacity of the reservoirs for the several years?

A I have for the past two years.

Q You may state it into the record.

MR. RAY: Now, Judge, for the purpose of adding cross examination, I think it is important we have what that capacity includes, for instance, whether it is between the outlet and supply dam. Is that what he figures as capacity,

lower outlet and supply over the dam.

Q I understand the capacity of a reservoir is the amount of water that is actually impounded, am I right?

A Capacity as I have it here is the actual amount of water in acre feet discharged over the reservoirs and measured at the junction of the two streams, about quarter of a mile below one and half a mile below the other.

Q That is then the amount of water that was ~~store~~ stored in the reservoirs for the two years?

A Yes.

Q And remained in the reservoirs and was discharged from the reservoirs?

A. Yes.

Q You may give us for 1914 first.

A During 1914 under the union Reservoir system including the Washington, Trial and Wall Lake reservoirs was ^{acre} 4600_A feet stored, and the provo Reservoir, independent reservoir system including the Lost Lakes, North Fork Lakes, Haystack Lakes, there was stored 490 acre feet. During 1915 the Union reservoir system ~~xxxxxxx599x~~ 4500 acre feet stored and in the Provo Reservoir independent of the lake system 395 acre feet.

Q Do you know whether or not the quantity stored was to the full capacity of the several reservoirs?

A In 1914 it was. In 1915 it was to the full capacity of Washington and Trial Lakes but not Wall.

Q Have you the acreage that was irrigated from the Provo Reservoir system in 1914?

A Yes.

Q What was the total number of acres irrigated?

A 4,786.

Q And the quantity of water used in the irrigation of it, have you that in acre feet?

A I have not in acre feet.

Q Do you know the number pf, or do you know the duty of water

used upon this land?

A The duty--

Q As used?

A In lowwater about 110 acres to the second foot and high water about 70 acres.

Q What period was covered by what you term the high water, what month?

A Approximately to the first of July.

Q And beginning about what time?

A Beginning about ^{fifteenth} first of April.

Q What period was covered by the low water?

A From the first of July until the first of October.

Q First of October. Did that end your irrigation period?

A Fifteenth of September ends our period covered by contract, but the system is operated longer, as desired.

Q Now, referring to the Blue Cliff Canal -- didn't you give me the 1915 irrigation?

A No.

Q I wish you would do do.

A In 1915 total acreage irrigated was 6,170.

Q What was the duty of water as used upon the lands in 1915?

A The duty varied considerably during the high water stage.

Q State how it was?

A It varied between -- well, approximately a second foot for 75 acres with the exception of a period in May when it was extreme cold weather there was very little run off and duty went way up at that time. During the low water season we operated on a duty of about 145 acres to the second foot.

Q Now, can you say as to what -- whether or not the crops produced under that duty was average crops with those produced on other lands on the prove bench during 1914?

A Yes, they were average.

Q And during 1915?

A

A During 1915 I would say the grain crops and early crops were average. The fruit crops were average. Some alfalfa suffered on account of insufficient supply of water.

Q Was that suffering during the forepart of the season in May, or later in the season?

A That was late in the season, principally during the latter part of July and August.

Q What was the number of acres of increase last year over 1914?

A 1384.

Q What is your acreage that is being irrigated under your system this year?

A I haven't got that.

MR. RAY: 1916 area.

Q You say you haven't got that?

A It is practically the same as ~~px~~ last year area.

Q What is the present capacity if you know, of your canal where it runs out onto the Provo Bench?

A You mean the canal or the conduit, you mean the amount of water we can deliver to the bench?

Q Yes.

A Approximately 135 second feet.

Q And what quantity is flowing in your canal this year?

A 115, about now.

Q What is the greatest quantity you have had this season?

A Between 125 and 130.

Q There is plenty of water in the river at this time, so that you take all that you want for the users under your canals?

A Yes.

Q And what is the duty that you are now putting upon the lands under your system?

A You mean gross duty or net duty?

Q Net duty?

A Second foot for about 60 to 65 acres.

Q By net duty you mean delivered upon the land, do you not?

A Yes, I mean delivered at the head gates of our different lateral systems where we are measuring the water to the users.

Q Have you an excess of water at this time, that is, have you any unused water in your canal?

A We have water that we are supplying to individuals on the end of our canal system who are not regular water subscribers.

Q It is all being applied upon lands under the system?

A Yes.

Q Now, where you deliver the water, the duty of which you have given as 60 to 65 acres at the head of the laterals, is there a loss between the head of those laterals and the place or places where the water is actually used upon the land?

A Yes, there is.

Q What is the length of the longest of these laterals from its head to where the water is applied?

A About two miles.

Q Do you know the net duty of the water -- by net duty I mean the water actually applied upon the lands under any of the laterals?

A Yes, in some cases, not general.

Q Where are they?

A On Provo bench.

Q Whereabouts with relation to the lands of the Provo Bench Canal Company?

A Some of the tracts are surrounded by tracts watered from the Provo Bench Canal Company, and others are above.

Q Can you give the duty as applied upon any of those tracts in 1914, the net duty?

A Yes, for certain irrigations, but not throughout the season. I made the individual determinations that took two or three irrigations, consecutive irrigations, but did not extend my observations over the season.

Q At what time of the year were those made?

A They ranged from August 6th to August 25th.

Q I wish you would give us those matters, the whole of the data ~~data~~ that you have in relation to the experiments made by you, naming the particular tracts of land so that it can be identified, if you can do so.

A The first experiment was on what is known as the Hanson tract.

Q What was the kind of land?

A It was a gravelly loam, the tract is on the ~~rather~~ north central part of Provo Bench and about a mile due west from the mouth of Provo Canyon.

Q What kind of a crop was raised?

A It was mixed garden and alfalfa crops.

Q Proceed, Mr. Jacobs and give us all the data as to each of the tracts which you have?

A The period between irrigations of the Hanson tract was six days, the area irrigated was 3.95 acres, the depth of water applied was in feet. 10 7/8.

Q The kind of land?

A Kind of land was gravelly loam.

Q Proceed.

A The duty of the water figuring the six day period amounts to a second foot of 111 acres. The second experiment on the Hanson tract on August 18th--

THE COURT: pardon me, you didn't give me the date of the first.

A August 6th. On the same tract August 18th the amount of water applied was .159.

Q The duty.

A Seventy-five acres per second foot. On ~~the~~ August 6, 1914, performed an experiment on the Denman tract which is situated along canyon road about a mile west from the mouth of the Canyon.

Q That is on the provo Bench?

A Yes, northern central part of the Provo Bench.

Q What date?

A August 6, 1914. This is a gravelly loam soil similar to the Hanson, and the crop peach orchard, rows one rod apart and six furrows to the row. The area irrigated was 9.86 acres. The depth of water applied was .155, the duty was 77 acres to the second foot. Number 4 --

Q Mr. Jacobs, you are not giving us the quantity or volume of the stream used and the time of irrigation, I wish you would do that.

A Do you wish that.

Q All the data which you have.

A I will go back to No. 1 then. The Hanson tract, first application the volume of the stream used was 2.28 second feet. The hours the water was used was two hours and ten minutes.

MR. THOMAS: Mr. Jacobs, if you ~~ka~~ would use the same form Mr. Wentz has used and give it to us in columns we could get it.

A I can put the tabulation on the board.

Q No, you need not do that.

A I will follow the same order throughout. The Hanson tract No. 2, volume of stream used 2.1 second feet; time of irrigation three hours ten minutes; area irrigated -- I gave that.

The Denman, first irrigation, volume of the stream used 3.69 second feet; hours time was five hours and ten minutes. Now, the No. 4 --

Q Did you give us the area?

MR. THURMAN: Yes.

A No. 4 is the second irrigation on the Denman tract.

Q The same land?

A The same land, date August 18th, the same period, six day period between irrigations. Volume of stream used was 3.38 second feet; the time was five hours and forty minutes; the

area irrigated 9.86 acres; depth applied in feet .162; duty is 78 acres to the second foot.

No. 5 experiments was made on August 7, 1914, J. F. Tresher tract located about the west central part of Provo Bench on the brink near the -- or on the east of the brink a short ways. The soil is a very sandy loam.

Q Kind of crops?

A Kind of crops was an orchard with crops between. The period between irrigations was ten days, the volume of the stream used was 2.25 second feet; time was nine hours and fifty minutes; area irrigated 7.46 acres; depth of water applied; .252 feet; duty 79 acres.

The Crandall tract No. 6 irrigated August 10, 1914, gravelly clay loam, situated on the north central, northeastern part of Provo Bench, the crop is alfalfa, this tract had not been watered for twelve days before the experiment.

MR. RAY: Now, your honor please, I desire to ask a question. Do you know of your own knowledge when that had been last watered?

A No.

MR. RAY: I move to strike out the answer when it was last watered on the ground it is hearsay.

THE COURT: That may go out.

A Period of irrigation was eight and one half days; volume of stream used 3.18.

Q That is the period between irrigations?

A Yes.

MR. THOMAS: Not period of but period between?

A Period between irrigations. Volume ~~31~~ 3.18 second feet; time 8 hours and 55 minutes. The area irrigated 7.79 acres depth of water applied .304 feet; duty 55 acres to the second foot.

No. 7 is the Crandall or same tract as No. 6, date of experiment August 19, 1914; the same data applies to this as

the other except the volume of the stream was 2.49 second feet.

The hours of water used eight hours fifteen minutes; area irrigated 8.67; depth of water applied .197; duty 85 acres to the second foot.

12:00 Noon, Recess to 2:00 P.M.

MR. THOMAS: May it please the court, in the cross fire this morning I made a remark that one of my brothers whom I respect highly -- might have had a little too much emphasis, might have been taken as too abrupt a remark to be properly addressed to the court, and I wish to assure the court and my brother that what I said was not with any intent to offend or cause offense.

THE COURT: What was the name of the last tract you gave.

MR. COLEMAN: Grandall tract.

THE COURT: You had finished that.

MR. A. C. HATCH: If the court please, I have what purports to be a true plat of the several canals using water from the Provo River, including the intake and portion of the Provo Reservoir canals prepared by Mr. Searles several years ago for the Utah Light & Power Company, and it appears to me that it would be of advantage to the court and to all parties litigant in Utah Valley if it be introduced and so that it may be referred to in the testimony as to locations of lands.

MR. RAY: No objection subject to our right to verify it.

THE COURT: It will be used only for the purpose of illustration, I take it, anyhow.

MR. A. C. HATCH: I cannot verify it because Mr.

Searles, the one who prepared it, is dead.

MR. RAY: We can examine it later.

MR. A. C. HATCH: It is marked plaintiff's Exhibit

47.

IRWIN JACOB - - - - -

DIRECT EXAMINATION by Mr. A. C. Hatch continued.

Q You may proceed, Mr. Jacobs.

A The Barney Biglow tract experiment taken August 11, 1914, soil, gravelly clay loam. This tract is located about the east central part of Provo Bench, about half or three-quarters of a mile from the east brink of the Bench. The crop on the tract was orchard trees, alfalfa between. Period between irrigations 8 $\frac{3}{8}$ days. The volume of the stream in second feet is 3.96, the time of irrigation was eight hours and forty-five minutes, the area irrigated was 9.60 acres, the depth of water applied was three-tenths of a foot, the duty 56 acres to the second foot.

The James Lovelace tract irrigated on August 11, 1914--

MR. COLEMAN: Is this a new experiment?

A Yes, this is No. 9. Gravelly clay loam, 16 inches deep; crop on the tract, alfalfa and orchard.

Q When you say alfalfa and orchard, is that both together, or alfalfa between the rows of orchard?

A No, this particular tract the alfalfa was separate tract from the orchard, but the irrigation was over the total area. Period between irrigation seven and seven-twelfths days; volume of the stream 7.86 second feet; time of irrigation two hours even; area irrigated 4.54 acres depth of water applied .287 feet, duty 53 acres to the second foot.

Experiment No. 10, Newell Knight tract --

Q Now, just a moment, with the Lovelace land was the alfalfa between, or were they separate tracts?

MR. RAY: He just testified they were separate.

MR. COLEMAN: Separate tracts he said.

A In explanation of the Lovelace tract, I suppose it will be necessary -- the tract is a long strip of land, 250 feet wide and 1538 feet long. The upper portion, that is the east portion, I should say, of this tract is in orchard, has alfalfa between the rows. The west portion is alfalfa straight. The tract lies with the long dimensions north and south. In the irrigation of this tract two separate stages were taken, the tract being over fifteen hundred feet long. It was observed the time necessary for irrigation for the first 750 feet, and the figures that I am giving you are based on the time consumed in irrigating the upper part of the tract. The figures corresponding to the lower half or the south half of the piece are as follows. Time of irrigation on the second part was three hours, the same size stream was used 7.86 second feet, the depth of water applied was .555 feet.

MR. RAY: The duty was what?

A I have not figured a duty on that. The duty was 23 acres to the second foot.

Q Now, do I understand that the water was diverted and put upon the second tract by itself, or did it simply receive the water that ran from the first tract?

A It received the water that run from the first tract after the first tract, 750 feet long was being thoroughly irrigated. The time was taken from ~~this~~ then to finish the irrigation of the whole area, and the total quantity of water additional was figured on the second tract. This water was run over the first tract.

Q But the second tract did not, in fact, receive the full quantity of water that was turned on?

A No, it didn't, & but it was -- in experimenting it was charged

in that way.

Q You don't have any data as to the water actually absorbed or put upon the second tract?

A No.

Q And assuming that all of the water that was turned on the upper part of the tract reached the lower tract or the second tract, it would have received the quantity that you have used?

A. Yes.

Q And in that case the duty would be the 23 acres of a second foot?

A. Yes.

MR. RAY: May we have the area of this second tract or did the first area given include both tracts?

A The area of the second tract was 2.98 acres. The area given of the first tract did not include that.

MR. COLEMAN: You gave the area, I understand as 4.54 acres, was that of the first tract?

A That was all the upper part of the tract, yes.

MR. COLEMAN: The entire area of the upper part?

A Yes.

Q The land was the same width for its entire length, was it?

A Yes.

Q Proceed, Mr. Jacobs.

A No. 10, Newell Knight tract, date of experiment August 18, 1914 soil sandy loam, Newell Knight tract is located about the central part of Provo Bench, along the State road running north across the Bench. Crop on the tract was berries and orchard. Period between irrigation 14 16/24 days.

MR. COLEMAN: Mr. Jacobs, by way of explanation, you say you conducted this experiment on August 18th, how do you know the period of irrigation then?

A Well, the period of this irrigation Newell Knight piece I don't know only --

MR. COLEMAN: Just from hearsay?

A From hearsay.

MR. COLEMAN: As a matter of fact you don't know how long prior that it was irrigated?

A The other tract I do personally know of.

MR. COLEMAN: But this one you don't?

A Not the Newell Knight piece, that was an experiment performed by Mr. Deming and myself. Mr. Deming might have that information I didn't know it from my own knowledge.

Q From whom did you obtain the information, as to the period?

A From the irrigator, man that was irrigating the piece.

Q Proceed?

A Volume of the stream was 4.39 second feet; the hours water used was one hour and 20 minutes; area irrigated 1.9 acres; depth of water applied .45 feet; duty 65 acres to the second foot.

No. 11 was another tract of Newell Knight land, experiment performed on August 18, 1914, soil, sandy loam, crop orchard, period between irrigations 7 1/3 days.

MR. RAY: Is that again a matter of hearsay?

A Yes, that is secondary.

MR. RAY: Move to strike it, if your honor please?

THE COURT: That may go out. I understood the witness to say a while ago that he knew of his own knowledge the other tract.

THE WITNESS: Except the Knight tract.

THE COURT: Very well.

MR. A. C. HATCH: Just the period irrigated goes out.

THE COURT: Yes, he said he didn't know it of his own knowledge.

A Volume of the stream 4.15 second feet; hours of water used three hours even; area irrigated 4.69 acres, depth of water applied .221 feet; duty 66 acres to the second foot.

No. 12 was also a Newell Knight tract, date of irrigation August 25, 1914; soil of tract, sandy loam; crop on tract is raspberries and potatoes; period between irrigation seven and a third days.

MR. RAY: Is that a matter of your own knowledge?

A No.

MR. RAY: Move to strike it.

THE COURT: It may go out.

Q Is that the same tract you irrigated on the 18th?

A It is part of the same tract, but part of the experiment was on some additional land.

Q As to a part of it you know the time?

A Yes.

MR. A. C. HATCH: We ask that that he knows may remain, and what he don't know go out.

THE COURT: He may testify to what he knows.

Q proceed, Mr. Jacobs.

A The volume was 4.1 second feet; time one hour and forty minutes; area irrigated 1.71 acres; depth of water applied .45 feet; duty 33 acres to the second foot.

No. 13 Will Downs tract, irrigated on August 22, 1914; soil, gravelly loam. This tract is located on what we would call the east central part of Provo Bench, crop on the tract, strawberries and peaches. Period between irrigations six days; volume of stream in second feet 3.31; time one hour and thirty minutes; area irrigated 2.35 acres; depth of water applied .176 feet; duty 68 acres to the second foot.

No. 14 W. A. Marriott tract. Date of irrigation August 22, 1914. Soil of the tract is gravelly loam; crop on tract peach trees with alfalfa between; period between irrigation twelve days, volume of stream in second feet 3.97; hours of water used four and one-half; area irrigated 4.08 acres; depth of water applied .348 feet; duty 68 acres to the second foot.

That is all I have.

Q Will you mark on the plaintiff's Exhibit 47 on the Board the approximate point, location of the several tracts of land upon which these experiments were made?

A Want them individually or collectively. They were within --

Q Have you a colored pencil with which you can indicate individually each tract separate?

A Yes.

Q Mark them with the number 1 to 14 inclusive

A The Hanson tract No 1 --

Q These were all irrigated with water from the Provo Reservoir Company's canal?

A Most of them with the exception of the Lovelace tract.

MR. COLEMAN: What number is that, No. 9?

MR. RAY: 9 and 10.

Q Proceed and indicate where they are located on the map?

A No. 1. No. 2 is the same. No. 3 --

Q Have you a colored pencil there?

A No, I have not.

Q Get one if you can.

MR. BAGLEY: How would it be to have the witness suggest which quarter section. This is all in Township 6 Range 3 East, if he will refer to the quarter section.

MR. A. C. HATCH: He can mark it in less time.

A Some of these will be approximated, as I cannot absolutely locate them.

Q Does it show what section they are in?

A For instance, the Denman tract, I don't know whether it is the south part of Section 9 or north part of Section 16.

Q We will understand then that it is only the approximate location?

A This is Nos. 3 and 4. No. 6 and No. 7, No. 8 and No. 9, 10, 11 and 12.

JW Allen

N

Rock Creek

Rock Creek

Marble Springs Pipeline 24"

House
Tanks

West Tunnel & Spring

JW Allen

JW Allen 50'

WD Wright 25a

Fence

Road

Whiting

Whiting

288
06/15
S

MR. THURMAN: Just a moment, where is the state road you spoke of?

A The state road goes through about this way.

Q Where is that.

A It is not shown -- well, it is shown starting here.

MR. RAY: What section, so the record will show.

A Well, it is shown in Section 32, just a short section of the road, possibly 10, 11 and 12 should be over a little farther towards the center part of 15. I should have said also the W. A. Marriott tract was irrigated from the Provo Bench Canal, and I have no information of my own knowledge concerning the period between irrigations, as stated here.

Q Have ~~xxx~~ you them all marked?

A Yes.

Q Mr. Jacobs, do you have any knowledge of the Maple Spring in Provo Canyon, where it is located? What is known as the Maple Spring?

A I know of no spring under that name.

Q Do you know of a spring that was formerly flowing into the Blue Cliff Canal that is now diverted into the City water pipe?

A Yes.

Q Where is that spring located?

A It is located about three-quarters of a mile up the canyon from ~~xxxx~~ the Heiselt place.

Q And with relation to the Blue Cliff Canal, is it on the mountain side above or below that canal?

A It was above.

Q So that it would find its way down to the canal?

A Yes.

Q Do you know whether or not that was distributed to the Provo Reservoir Company, ^{a part of} as its water at any time?

A Yes.

Q When was it?

A During 1912.

Q And after that what was done with it, if you know?

A I don't know of anything.

Q In 1913, '14 and '15, have you any knowledge of it?

A I think during 1913 --

MR. RAY: We object, your honor please, what the witness thinks, if he doesn't know what was done with it.

A Well, during 1913 it was distributed to the Provo Reservoir in connection with this water, during part of the season, I don't know whether it was distributed all season or not.

Q Who made the ~~st~~ distribution in 1912?

A Mr. Farrar.

Q Who in 1913 made such distribution of it as you have knowledge of?

A Mr. Wentz and also Mr. Farrar.

Q Are you acquainted with the other springs that are in that vicinity?

A Yes.

Q What are known as the Pony Steele Springs? and Blue Cliff Springs? A. Yes.

Q Have you at any time made a measurement or an estimate of the quantity of water flowing from the several springs, Pony Steele springs and Blue Cliff springs excluding the Maple Springs?

A I have.

Q What ~~is~~ quantity of water did you find the aggregate to be?

A The aggregate of the Blue Cliff and Pony Steele together?

Q Yes.

MR. RAY: Is the Blue Cliff Springs the one you refer to as the Maple Springs, Judge?

MR. A. C. HATCH: No, as I understand the facts to be, there are several small springs that found their way into the Blue Cliff Canal and have been distributed to the Provo Reservoir Company as part of the original appropriation of

water.

MR. THOMAS: For information, Judge, part of the Blue Cliff claim?

MR. A. C. HATCH: Yes.

MR. THOMAS: Included in what was appropriated as the Blue Cliff right?

MR. A. C. HATCH: Yes, exclusive of its rights as awarded to it from the Provo River proper.

MR. THOMAS: You misunderstood my question. I asked if they were included in that, that is, in addition to what was included in the Blue Cliff right.

MR. A. C. HATCH: The Provo River water.

MR. RAY: I understand that is simple the contention of course. Counsel is not asserting that as a fact. That is one of the things the court will have to determine.

MR. A. C. HATCH: That is why we are offering this proof. It is what we claim.

MR. THOMAS: I understand, thank you.

A The four springs or five springs measured by me totaled .414 second feet. There were two --

Q Now, will you give the quantity of each, naming it?

A I have them listed according to numbers, No. 1 --

MR. COLEMAN: Which is No. 1?

A Beginning at the southwest point, that is at the point on the Blue Cliff ^{Canal} at the southwestern extremity of the spring area. No. 1 .083 second feet; No. 2, .064 second feet; No. 3, .073 second feet. No. 4 --

Q The Pony Steele Springs give that separate.

A The first three are what are known as the Pony Steele ~~are~~ Springs.

Q That is the three you have given?

A Yes, the fourth one is --

Q What is the aggregate of those three?

A .225 second feet.

Q What is the fourth one?

A The fourth one is a spring which has been held jointly by the Blue Cliff and Heiselt.

Q Hyrum Heiselt?

A Yes, one half each. Counting one half of that spring which totals .183 the Blue Cliff right would be .091.

MR. COLEMAN: What is the name of that spring?

A I never heard any name.

Q Now, the other springs, where are they located?

A The other springs are the Blue Cliff springs.

Q Where are they located?

A Located from a half to three-quarters of a mile up the canyon from Heiselt's place.

Q What is the quantity of water?

A There is only one spring that we were able to measure. That discharged that .098 second feet. Two other small springs so scattered it was impossible to measure them, and the upper spring of what is known as the Blue Cliff spring was in the city pipe line and it was impossible to measure that.

Q Mr. Jacobs, going back to the irrigation experiments made by you, I will ask you if you are acquainted generally with the soil on the Provo bench under the several canals conveying water upon the Bench?

A Yes.

Q What have you to say as to whether or not the lands upon which you made these experiments are the same kinds of lands, that is, generally the same, as the other lands upon the Bench?

A I should say they are generally similar.

Q And did you direct the placing of the water upon those tracts, and length of time, or was it done as the farmers chose to do it themselves making the experiments?

A These experiments were simply the results of the farmers' irrigation as they did it themselves as was their habit of doing.

Q You made the measurement of the water to the lands?

A Yes I measured the land and the water applied and the time.

Q And kept the time of the application?

A Yes, the farmers did their own irrigating.

Q There seems to be an impression that the reason the water that goes into the city pipe was not measured was because it was so scattered that you could not measure it, what was the fact in regard to that.

A I don't know, I have not been up to the intake of the city pipe since it was put in.

Q You didn't make any measurement there of any springs running into the city pipe?

A No.

Q Do you know what year it was put into the city pipe?

A I do not.

Q Known as the Maple Springs?

A About a year ago, I think.

CROSS EXAMINATION by Mr. Willis:

Q Calling attention to these tracts that were irrigated, Mr. Jacobs, ^{they} ~~this~~ average or they run from 23 to 66 acre duty.

MR. RAY: No. 111.

THE WITNESS: It is 111.

Q So they had two irrigations, the same land used, there was two irrigations under your supervision of each of these tracts, was there, about that time?

A Most of them.

Q And what was the result as to that being the quantity required, what did you determine as to that?

A The only determination I made on that was general observation of the crop condition.

Q What was the conclusion from your general knowledge?

A Well, in no case did I see any indications of crops suffering

- Q And you felt that that was the quantity of water that was required at that particular time to irrigate these several tracts?
- A No, I rather felt that that quantity was sufficient.
- Q Was any of it wasted in irrigation?
- A Yes sir.
- Q Was there a waste in each case on the first application?
- A I wouldn't say any -- you mean experiment No. 1?
- Q Either of the tracts, I am speaking generally, if there was any difference as to No. 1, or any of the other numbers, please state?
- A Yes, there was quite a difference. I wouldn't say the water was generally wasted in certain cases. It was, for instance, in the Lovelace tract where the water was run over fifteen hundred feet with one regulation. Undoubtedly a large portion of that water applied during the last part of the irrigation was wasted. That is an extreme condition.
- Q Did you irrigate the Lovelace tract the second time?
- A No.
- Q Just one irrigation?
- A Just one irrigation.
- Q Why did you select these particular tracts as an experiment, Mr. Jacobs?
- A These tracts were selected, the Lovelace tract and the Jewell Knight tract and Marriott tract were selected during -- that is, they were selected by Mr. Deming.
- Q Then you don't know of your own knowledge why these particular tracts were selected?
- A I don't, they were selected in connection with the case at the time that protest was made by the Provo Reservoir Company against the actions of the commissioner.
- Q Were you working under the direction of Mr. Deming at that time?
- A No, I was not, I was working in connection with him.
- Q Then was Mr. Deming in the employ of the Provo Reservoir Company?

Q Mr. Deming was court commissioner at that time, distributing the water of provo River.

Q And you were there in the interest of the provo Reservoir Company to determine the results for their information, were you?

A Yes.

Q Now, what tracts did you irrigate a second time? Give us one that you irrigated a second time?

A Tract No. 1, Hanson tract.

Q In the first application was any water wasted in that?

A No, I wouldn't say there was any water wasted.

Q Then the same conditions prevailed as to the second tract, or the second application?

A Yes.

Q Did you in any way have the supervision of that or were you just there to determine the result, Mr. Jacobs?

A That is all I just determined the results. They irrigated the land as they were in the habit of doing.

Q Now, who distributed the water that was distributed from the Provo Reservoir Company's system?

A It was done under my general direction and immediate direction of Mr. McCune

Q Did you have any special instructions as to the duty of water that was to be delivered to them at that time, that is the quantity taking into consideration the duty?

A No, he was in another complicated distributing system and we simply took the quantity of water that would naturally come to him under the natural regulation of the system.

Q You say this was during the month of August?

A Yes.

Q And in that same year 1915, I understand you these experiments were made in the year 1915.

A 1914.

Q Then for 1914 you state that during the low water period the

average duty under the Provo Reservoir system was 110 acres?

A Yes.

Q Now, why did you make a difference in that duty in these particular tracts between that and the other users under the Provo water system?

A Well, all the tracts were not irrigated from -- that is, all the tract was not irrigated every six days, man might have twenty acres and only irrigate part of it this time and part next.

Q Now, during the year 1914, during the low water period, you delivered, as I understand you, water on a duty of 110 acres out of the provo Reservoir system?

A That would be about the general average.

Q I mean approximately?

A Approximately.

Q Did you deliver that water, or measure it out to the different users along the system? A. Yes.

Q Was that a part of your duty?

A Yes, I measured the water, rated the flume and gave Mr. McCune, who distributed the water under me a tabulation, showing the amount to turn to each gate and then I would check him up on that.

Q Now, as a matter of fact do you know anything about this other than the measurements of the water at the several laterals along the system, what was done, the use of it, or how it was used, of your own knowledge?

A Yes.

Q Do you know as to all the tracts of land?

A No, I don't.

Q How many of those tracts of land during the time that the duty was approximately 110 acres did you visit and inspect?

A Why, I visited the majority of them.

Q How often during that period?

A I can't say, probably some I only visited once during the season. I am speaking of the whole area now.

Q I am speaking of that same thing in a general way.

A Yes.

Q Now, you testified that they raised average crops under a 110 acre duty, didn't you? A. Yes.

Q Now, can you say this, how many of those several tracts did you visit that you can of your own knowledge that they raised average crops, that is, what percentage of the land?

A I could not figure the percentage.

Q Would it be twenty-five per cent?

A Oh yes, it would be a majority. In connection with my duties I more or less was closely connected with the tract, that is, I would observe them as I went about my duties of distribution during the season, but as to just the percentage of tracts that I probably missed, I cannot say.

Q Can you say of your own knowledge that any of the tracts of land were irrigated under a duty of 110 acre duty; how do you know but what that ^{water} was applied on a less quantity. Do you know of your own knowledge that it was not?

A Taking the whole quantity of water, I do not.

Q And the same thing can be said as to the year 1915 on 145 acre duty, can it? A. Yes.

Q You could not say that any crops were raised under the Provo Reservoir system for either the year 1914 or 1915 on 140 acre duty, could you other than that quantity or those quantities were delivered to the users?

A No, I could not.

MR. A. CHATCH: If the court please, I don't understand he has said anything of that kind at any time during his testimony. I therefore cannot understand ^{what} why counsel is trying to get at.

MR. WILLIS: Is the court please, he has testified

in direct that during the high water period in 1914 the 70 acre duty was the standard on the Provo Reservoir system, and the 110 acre duty in the low water season. Now, the question is this -- and he also testified that average crops were raised there. The question is this, what we want to determine is is he knows of his own knowledge just what duty was used. He may know what was delivered but as to the duty and use in order to produce those crops, is what we are trying to determine.

THE COURT: yes, I remember his evidence substantially as you have stated it, although, as I remember it in the year 1915 he said the grain crop was an average crop. The later crops suffered somewhat materially for the want of water.

That is 145 --

MR. WILLIS: That is as I understand.

THE COURT: The grain crop was an average crop as I understand it.

MR. WILLIS: That is all anyway.

CROSS EXAMINATION by Mr. Coleman;

Q Mr. Jacobs, what do you mean by 110 acre duty, is that based on the actual acreage or on shares of water in the Provo Reservoir Company?

A That is based on shares of water.

Q So that if a man owned five acres of land and owned fifteen shares of water in your company you would turn him the fifteen shares of water amounting to fifteen shares?

A Yes.

Q You would turn him if he owned fifteen shares, you would turn him what ~~that~~ that quantity -- the quantity of water sufficient for the fifteen shares?

A Yes, irrespective of the land.

Q So that a man might own fifteen shares of water and only irrigate five acres of land?

A He might, yes.

Q so all you base your judgment on then is the number of shares owned under the respective laterals?

A Yes, and also the fact that if a man does not irrigate the number of acres he has shares for he very readily lets you know about it.

Q Aren't there a number of people on Provo Bench who are using fifteen shares of the Provo Reservoir Company's water on four and five acres of land?

A I don't know of any cases.

Q You don't know of any cases?

THE COURT: Let me ask, so I may understand the effect of this evidence. Is one share supposed to represent water enough for one acre, is that the idea?

A Yes, that's the idea.

THE COURT: That is the plan, now you may proceed.

Q So you don't know how many acres these shares irrigate, actually irrigate?

A Not by measurement.

Q A person can buy extra shares, could irrigate his land if he wishes to, can he not, irrespective of the number of acres he has?

A. Yes.

Q Your company is glad to get the money, you are not particular about the acreage. Now, if you say that hundred acre duty is sufficient why did you call upon Commissioner Deming in 1914 and complain because you were not put on a 70 acre duty?

A I didn't know that I called on Commissioner Deming.

Q Didn't you call on him?

A For a 70 acre duty? or any specific duty.

Q Didn't you complain because Mr. Deming had not turned you sufficient water for your irrigation system in 1914, don't you recall that?

A At what time?

Q It was along in the summer, I don't remember just what particular time.

A I remember during the summer of '14 we were operating on something over a hundred acre duty instead of a 70 acre duty.

Q But you wanted to be put on a 70 acre duty, didn't you, and asked Commissioner Deming to put you on that duty?

A I don't know of any request.

Q Don't know of any. Why is it Mr. Jacobs, that you are putting hundred and hundred and fifteen and twenty second feet of water in your canal, when you are only irrigating, as you state forty-eight hundred or five thousand acres?

A We figure this time of the year that 70 acre duty is not too much.

Q Well, at any time of the year isn't it a fact you put hundred second feet or more in your canal when you are only irrigating forty-eight hundred acres of land, forty-eight hundred shares?

A Not during the summer, low water period.

Q So your testimony as to the duty of water is purely based on the shares of water in your irrigation company?

A Yes.

CROSS EXAMINATION by Mr. Thomas.

Q How much water did you tell Judge Hatch you had running through the conduit now into your system, was it 115 feet?

A Approximately 115.

MR. A. C. HATCH: If the court please, I think probably it would be more in order when there are so many of these people that we be allowed to redirect after each of the several defendants have cross examined, and keep in mind the matter on which that particular one has made his examination.

THE COURT: It is immaterial to the court other than this, that opens up possibly matters that would take considerable time, if you redirect and then possibly a little more cross

examination by the party. I am inclined to think we would proceed a little faster. However, it may be a little difficult for you, if it is I will let you do that under special circumstances, if you find it necessary.

MR. A. C. HATCH: I would like to ask particularly about a matter brought out by Mr. Coleman.

THE COURT: You may do so at this time.

RE-DIRECT EXAMINATION by Mr. A. C. Hatch;

Q Did you at any time have any knowledge of any protest having been made to Mr. Deming because the Provo Reservoir Company was not put upon a 70 acre duty?

A No, I did not.

Q Do you know that protest was made to Mr. Deming by the Provo Reservoir Company in 1914? A. Yes.

Q State what it was?

A Because the distribution to the Provo Bench Canal Company was made at a 40 acre duty.

Q And what was the duty that you were using at that time?

A Approximately 110.

CROSS EXAMINATION by Mr. Thomas continued.

Q I was looking for the note I made as to the statement you made as to the amount of water now running through the system, was it 115 or 135?

A 115 now about, it fluctuates somewhat.

Q But it is practically 115? A. Yes.

Q That would lower the duty to about 50 acres, wouldn't it?

A Well, I was counting the duty at the points of diversion of the various laterals. We have a certain loss that has to be taken care of.

Q I was trying to ascertain what water you were now taking through the system?

A We are taking 115 second feet, delivering it at the Bench. We have a certain loss and between 60 and 65 acre duty.

Q Of course in taking the water under our present system you have to include that loss in your acre duty, wouldn't you?

A I don't get just what you mean by that question.

Q You are taking, as I understand it, 115 second feet of water out of Provo River, figuring your own acreage as you have given it, that 115 feet of water if carried without loss would do duty on a basis it is now being used on the basis about one foot to 50 acres of land approximately?

A Yes, something like that.

Q Now, in arriving at your duty, you stated, as I remember the testimony at times duty went from one foot to a hundred acres, sometimes going 110 acres? A. Yes.

Q That is, during the low water season?

A Yes.

MR. COLEMAN: 145 acres in 1945.

Q Now, do you know -- your business, as I understand it, is to pass over the stream and apportion the water according to the shares to the respective laterals?

A Yes.

Q And where a lateral calls for a specific number of shares, then you see that proportion of the stream represented by the shares is diverted into those laterals?

A Yes.

Q So that in arriving at your duty, as you have given it here, you base the number of shares that you turn out on the number of acres represented by that lateral, did you?

A Yes.

Q So that, as a matter of fact, you don't know whether that water that you diverted through the laterals actually did duty, did service upon the 110 and 145 acres, or whether it was used on a smaller tract, do you?

A I don't know absolutely.

Q As a matter of fact, you don't know at all about that?

A It is my judgment that it was.

Q Yes, but you don't know of your own knowledge?

A No.

Q So that, when you were giving your estimate as to your duty, you were basing it wholly upon the shares represented by the owner in the company that was charged against his particular lateral at the time you diverted it?

A Well, there are some cases, considerable number of individual cases that I know, for instance, a man has ten shares of our water, and he is irrigating ten acres of land with it, but to know absolutely every man is irrigating exact number of acres for which he has shares, I could not say.

Q You don't know?

A I know of considerable number of individual cases.

Q Can you give us the name of an individual who had 145 acre duty of water and raised an average crop thereby under your system?

MR. JACOB EVANS: We don't claim anything of that kind.

MR. THURMAN: That is when he had a short crop when he had that duty.

THE COURT: That is my recollection.

MR. THOMAS: I don't want to put words in the witness's mouth that he didn't give, of course, I understand him to say even with that very high duty an average crop was raised.

MR. RAY: Of grain, he said.

THE COURT: Early crop, average crop, but in that year during the early period was 75 acres, and the combination of the duty of 75 during the high water and 145 during the low water period, succeeded in raising, as I understood the witness, average crops of the early grain. That is, those grains that were harvested early in the year, but the late crops, there was

a shortage. That is the substance of the evidence as I got it.

Q Was there any crop raised on those lands where the water or duty one second foot to 145 acres?

A Was there any crops raised?

Q Yes.

A Yes, there were crops raised.

Q What was the crop raised?

A Well now, I will modify that, I don't know of an actual, or of a case where a duty of 145 acres raised a crop; that is that I have measured up the strip of land and found that amount of water applied.

Q That is if the water could have been taken at all or -- let me withdraw that -- that in ~~xxxx~~ such cases if the water did duty at all it did duty or had to do duty on 145 acres, is that what you want us to understand?

A Yes, as I said before, some alfalfa tracts that I had in mind when subjected to a duty of 145 acres suffered in the latter part of the season.

Q Let me interrupt you there, when you say it suffered, are we to understand there was no crop raised?

A No, partial crop raised.

Q Partial crop only. Now, as a matter of fact, that particular tract you have in mind, the crop was pretty badly burned, wasn't it?

MR. THURMAN: That is the 145?

MR. THOMAS: Yes.

MR. THURMAN: If the court please, we don't contend on the Provo Bench anywhere 145 is sufficient. If we can shorten this examination by making that admission we will do it.

MR. WILLIS: The question I raise in this is to test the credibility of the witness as to any of it.

MR. THURMAN: Any of what?

MR. WILLIS: Anything he had testified to in the way of duty of water.

MR. THOMAS: D^o I understand, Judge Thurman, that you don't contend that such high duty would produce crops on the Provo Bench. Do you contend --

MR. THURMAN: We don't contend it is sufficient water.

MR. THOMAS: Will you admit it is insufficient water to produce a crop?

MR. THURMAN: I won't say it would not produce any crop. I think perhaps it would produce some kind of a crop, but now a crop worth while, a man giving his attention to.

MR. THOMAS: I agree with you fully and am trying to ascertain what kind of a crop this was. I might say we could go to interminable lengths on this, but what I want to get at is what kind of a crop was raised at that particular place with that amount of water. Now, tell us just the condition, Mr. Jacobs --

MR. RAY: Nobody contending for that duty, I object to it as immaterial.

MR. JACOB EVANS: We second the motion.

MR. THOMAS: Does anyone contend it is anywise sufficient? Certainly we don't. If the plaintiff says it is wholly insufficient we will desist.

THE COURT: That is the substance of the statement made by Judge Thurman.

MR. BAGLEY: Let me ask counsel for the plaintiff a question. Don't your contract provide that it is considered as primary water right between a duty of 75 and 150 acres?

MR. JACOB EVANS: I could not answer that.

MR. A. C. HATCH: Our contracts are a second foot for 70 acres as long as it can be maintained, but we will not be held liable for breach if we furnish a second foot for 150 acres. in the later water season or ~~xxx~~ very dry season.

MR. THURMAN: On some lands that might be considered

sufficient, I don't know .

MR. A. C. HATCH: And on some lands and some kind of crops we say that is sufficient if utilized by the users to the best possible advantage. In some cases by a pipe system I understand that as high as a thousand acres of orchard is irrigated with a second foot of water, some parts of the United States.

MR. RAY: We object to counsel testifying here, your honor please, unless he is sworn.

MR. A. C. HATCH: I am simply answering the question asked by Mr. Bagley.

MR. THURMAN: The Judge's word is as good as an ordinary witness under oath, anyway.

MR. RAY: He is testifying to hearsay.

MR. A. C. HATCH: No, I have witnessed the process of the irrigation where they use the pipe system, delivered the water.

THE COURT: Are these admissions satisfactory to you so you don't care to examine further on that point?

MR. THOMAS: On that point. Now, that I may understand the matter so as to shorten the cross examination, plaintiff admits that such quantity of water as one second foot to 145 acres would be wholly inadequate to raise a crop?

THE COURT: Raise the ordinary crops raised by farmers.

MR. THURMAN: On Provo Bench land, that is all he has testified about.

MR. THOMAS: Then I want to know about these lands in Provo City, that Provo City is interested in. Let us understand that now, so we won't be out short subsequently. I have stated as I understood the agreement to be, or the stipulation. Now, do I understand, Judge Thurman, that he limits that wholly to Provo Bench Land?

THE COURT: I understood him to so state basing it upon the fact this witness has not testified at all with reference to any other lands.

MR. THOMAS: Does Provo Bench lands only include those lands under the Provo Bench Canal, or other lands similarly controlled by the Upper East Union or East Union, Little Dry Creek?

MR. THURMAN: I will say the lands he testified t about.

MR. THOMAS: Let us have the canals named so that we won't be under any misapprehension subsequently and have
8 arguments what has been stipulated to.

MR. A. C. HATCH: The East Union and Upper East Union are on another side of the river from any of the lands this man has testified to, as shown by the Exhibit 47.

MR. THOMAS: I understand that, Judge Hatch, but it is for the purpose of shortening the cross examination, and you have made a certain statement as to your stipulation, I want to know if you will carry that stipulation to lands that are on the south side, which are similar to those lands on the north side of the river?

MR. A. C. HATCH: If the court please, we will admit that under the present system of irrigation and use of water that as to those lands, that the record remain during the entire season that there are none of the lands under the Provo River system that a duty of 145 acres per second foot would be sufficient.

MR. THOMAS: That covers it very explicitly.

MR. THURMAN: Now, take up 144, process of elimination.

MR. A. C. HATCH: We don't even under that admission admit that under ~~the~~ certain condition and certain uses the 145 acre duty might not be sufficient for some lands under our sys-
~~tem~~ tem, which extends into the Salt Lake County.

Q Looking over my notes, Mr. Jacobs, I find that you stated in July, I think, of 1915, or rather after July 1, of 1915, there was no water available or in your system, did I understand you aright, after July 1, 1915 that you had no water available?

A About July 1st is when I went down to about the 145 acre duty.

Q And was it later in the season your water failed you?

A No, water never failed us, we continued throughout the season on that duty.

Q Then I misunderstood you on direct examination. When you said that the crops were normal crops and thrifty, did you have reference to the time of their harvest, or the early spring, along in the latter part of June?

A Well, general condition of them through the season as observed by me.

Q Were you able to make any investigation as to the tonnage per acre of alfalfa and bushels per acre of grain harvested?

A No, I did not.

Q You could not give any testimony then as to that?

A No.

Q I wanted to ask you a question about the lakes, Mr. Jacobs, then I think I am through. Did you take into consideration at any time when you were measuring the water the approximate amount of precipitation that occurred in those lakes in that region? A. No.

Q Have you any data on that at all?

A I have none.

Q Is it a fact that there is considerable precipitation there during the summer months, do you know?

A Well, depends on what considerable means. There is some precipitation.

Q Can you give any information to us at all what precipitation